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The Impact of Collective Identity on the relationship between Effectuation and Environmental Hostility

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List of abbreviations

AVE	Average Value Explained
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Collective Identity
CLF	Common Latent Factor
CMB	Common Method Bias
CMV	Common Marker Variable
CR	Composite Reliability
CSES	Collective Self-Esteem Scale
EFA	Exploratory Factor Analysis
EH	Environmental Hostility
GFI	Goodness of Fit Index
ICE	International Corporate Entrepreneurship
KMO	Kaiser–Meyer–Olkin
LV	Latent variable
RMSEA	Root Mean Square Error of Approximation
SME	Small or Medium-sized Enterprise
SIT	Social Identity Theory
(S)RMR	Standardized Root Mean Residual
VIF	Variance Inflation Factors

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1 Introduction

As Sharma and Chrisman's (1999) definitions of entrepreneurship and entrepreneurs said; entrepreneurship includes acts of organisational creation, renewal, or innovation that occur within or outside an existing organisation. Entrepreneurs are defined as individuals (or groups of individuals) who act independently or as part of a corporate system, who create new organisations, or who initiate renewal or innovation within an existing organisation (Sharma & Chrisman, 1999).

In order to understand the entrepreneurial economy and measure the entrepreneurship level, it is also critical an understanding of the actions and behaviours of entrepreneurs. Effectuation is an approach that helps to understand the entrepreneurial process, which differs from the other approach known as causation, both proposed by (Saravasthy, 2008). Effectuation processes are consistent with emergent strategy and include a selection of alternatives based on loss affordability, flexibility, and experimentation (Chandler *et al.*, 2011, p. 375).

When it comes to entrepreneurship at the corporate level, whether it is in business start-ups, innovation or opening up to new markets, different aspects take part. These aspects are both in internal and external level.

On one hand, Environmental Hostility (EH) is considered as an external hostility which may temper their willingness to do so and the subsequent potential for international growth. This hostility may relate to industry and market characteristics, such as governmental actions and highly dynamic and competitive market conditions (Kuivalainen, et al., 2004; Zahra & Garvis, 2000; Covin & Slevin, 1989).

As far as the internal level is concerned, the way in which the leaders, the responsible people for managing the company, feel or define themselves plays a decisive role. Their personality and how they and other people see them, is one of the main potential internal factors affecting to the Effectuation. This aspect is considered as Collective Identity (CI). Self-esteem is commonly

conceptualized as a very important component of the self-concept. Luhtanen & Crocker (1992) have developed a scale to assess individual differences in collective self-esteem and in this thesis is going to be used in order to evaluate and assess its impact in the relationship between Effectuation and Environmental Hostility.

To shed more light on the effectual processes and how the personality of the leaders can affect, the effects of Collective Identity and Environmental Hostility on small and medium sized enterprises (SME) Effectuation has been studied in order to find a possible relationship.

The empirical part of the study comprises an explorative analysis of the data to detect possible missing data or outliners, followed by factors analyses (e.g. Exploratory and Confirmatory) of the constructs studied. The data studied has been extracted from a survey of 50 German SMEs, representing several sectors, which are less than 5 years old at the moment of the study. Exploratory, confirmatory factor analysis and regression models are used in the analysis to validate the constructs. Subsequently a regression analysis is performed in order to explore the moderator effect of Collective Identity in this relationship between Effectuation and Environmental Hostility.

Next, follows a brief introduction to previous literature of the research topic in which is explained the different constructs and previous studies to have a deeper knowledge of what is here dealt and the state of art as the research way.

2 Literature and research

Identity and identification are root constructs in organizational behaviour research (Albert, et al., 2000). They are framed by social dynamics in the same manner as identities locate the self in society (Jones & Hynie, 2017).

Within a personal, relational or collective frame, every individual incorporates multiple identities. Every part of this self-concept can be expressed differently across contexts and settings.

How individuals perceive and place themselves towards their work and the work context within their organization plays a crucial role for interpretation schemata, the motivational mechanisms that result, and the effectiveness in which they interact with their environment (Albert, et al., 2000, p. 13; Rosso, et al., 2010, p. 99).

Especially in ever more complex and dynamic environments, leaders must build a strong core of what the organization stands for to reside within the heads and hearts of its members (Albert, et al., 2000, p. 13).

This study contributes to filling this gap between Effectuation and Environmental Hostility and personal identity research by empirically investigating Collective Identity as a potential moderator.

In the next section, the theoretical background of the study is going to be discussed, followed by the set out of the research aims and the formulation of hypothesis on the impact of Collective Identity in the relationship between Environmental Hostility and Effectuation. Subsequently, the research data and methodology is described followed by the corresponding obtained results.

2.1 Theory

2.1.1 Introduction to Collective Identity

For a better understanding of what is here studied, is required an explanation about what Collective Identity is and how it is acknowledged in Social Identity Theory (SIT) (Tajfel, 1982).

According to SIT, social group memberships are really important to individuals' self-concept and social behaviour considering that a social group is a collection of individuals who see themselves as members of the same social category. In this theory, it is said that the self-concept has two different aspects or according to American terminology (which we will use here) three aspects.

These three aspects are: personal, collective and social identity. Personal identity refers to how people view themselves as individuals. It indicates personal values, ideas, goals, etc. which also includes attributes as specifics as talent, competence and sociability.

Collective Identity, in American terminology, refers to the part of the self-concept that is based on membership in social groups or categories. A social group is considered as a collection of individuals who see themselves as members of the same social category (Luhtanen and Crocker, 1992). However, European social psychologists name it Social identity and it refers to how they view the social groups to which belong. It is also defined as "that part of an individuals' self-concept which derives from his knowledge of his membership in a social group together with the value and emotional significance attached to that membership" (Tajfel, 1981, p. 285), in what appear aspects of the self-concept related to race, ethnic background, religion...

Considering these differences, Social identity for authors as Cheek and his colleagues (Cheek, 1989; Cheek, et al., 1985) is used in reference to interpersonal domains and social roles, referring to the self in relation to others such as one's popularity, attractiveness, reputation...

There is also a will to make a distinction between personal and collective aspects (Hui, 1988; Triandis, 1989) which are established as Collective Identity and collective self-esteem. These

aspects of identity relate with memberships in social groups and the value placed on one's social groups distinguishing between individualism and collectivism.

SIT postulates that individuals strive to maintain or improve not only a positive personal identity, social identity for American psychologists, but also a positive Collective Identity. Several other social psychological theories of self-esteem have argued that individuals struggle to maintain and enhance a positive self-image (Greenwald, 1980; Jones, 1973; Wills, 1981) and this is seen in individuals who are high in self-esteem through their social behaviours. Consequently, individuals with low self-esteem tend to be more self-protective and show unrealistic optimism for the future and unrealistically positive views of the self.

The construct of self-esteem has been empirically and theoretically studied (James, 1890 / 1950; Rosenberg, 1979) but the focus have been mainly on the personal part of the self-concept or personal identity.

Most of the existing self-esteem measures are characterized because are mainly focused on individuals' self-evaluations based on their personal attributes. Therefore they have a lack of consideration in Collective Identity what offered a partial view of individuals.

According to this, Luhtanen & Crocker (1992) argue that whereas personal self-esteem tends to moderate the use of self-serving biases, collective self-esteem could moderate in-group bias, in-group serving attributions and more group-level strategies.

Breckler, Greenwald and Wiggins developed a scale where collective self-esteem was measured (Breckler, et al., 1986). This scale established three motivational facets of the self: public, private and collective.

Tajfel and his colleagues argue that Collective Identity might be positive or negative according to the evaluation of one's social group, rather than one personal's attributes or achievements within groups (Tajfel & Turner, 1986). SIT argues that a positive CI is developed when an

individual perceives his or her social groups as a valuable in comparison to other groups (Utsey & Constantine , 2006).

Although the collective self is defined as the "we" facet of the self, the achievements on this facet are focused on the fulfilment of one's individual role within reference groups, based on how individuals see themselves in the context of specific groups (Luhtanen & Crocker, 1992). Evaluations on how good they are as members of their social group is considered an aspect of collective self-esteem, on the other hand they do not appear to capture the sense of collective identity.

Results from Luhtanen & Crocker (1992), show that collective self-esteem is considered to moderate the extent to which individuals attempt to protect or enhance their collective identities.

Identities change, in fact, slowly (Burke, 2006, p. 91), which is why they are seen as moderators instead of mediators of transformational leadership and public value effects, because mediators assume to change with their independent variable (Neumann, 2018). Identities align and shape the individual's motivation to formulate plans and achieve levels of performance that are reinforcing, supporting, and confirming this self-perspective (Burke & Reitzes , 1981, p. 84).

2.1.2 Introduction to Environmental Hostility

Globalization of the world economy has encouraged firms to expand into new markets. These new markets, existing or foreign, have allowed companies to acquire new abilities through alliances and joint ventures because domestic strengths do not always guarantee success in foreign markets.

A set of company efforts related with innovation, proactiveness, and risk taking define the International Corporate Entrepreneurship (ICE) shows the company performance. According to this, entrepreneurship can be considered as a logical means of exploiting business opportunities

(Covin & Slevin , 1989). However, sometimes these opportunities are reduced due to constraints imposed by other competitive forces that are already taking part of that environment.

Environmental Hostility is defined as these unfavourable external forces received by a firm's business. These unfavourable external conditions are the result of radical industry changes, intense regulatory burdens placed on the industry, or fierce rivalry among competitors (Werner, et al., 1996).

Dynamic environments were found to encourage entrepreneurial firm-level behaviour (Miller, et al., 1988; Khandwalla, 1987). Higher levels of innovative, risk-taking behaviour are also associated with uncertain environments (Pierce & Delbecq, 1977). When firms are faced with hostile environments, as in the high-technology sector, an entrepreneurial strategic orientation contributes to greater performance.

Perceiving competitive market, product uncertainties and changing demand conditions and radical innovations that render the firm's basic technology obsolete also become in unfavourable conditions (Agarwal & Ramaswami, 1992).

International markets have been widely defined as hostile (Hitt, et al., 1997) because external environments are much different due to diverse and inconsistent laws, national cultures, and industry forces (Rosenzweig & Singh, 1991). Therefore, in order to ensure the achievement of the organizational established goals, firms must dedicate its resources to manage these unfavourable conditions through investing heavily in understanding local conditions. The payoff obtained by the venture is moderated by the executives' perception of the environmental hostility. While environmental hostility may positively influence company performance, the relationship may not be linear (Zahra & Garvis, 2000). As perceived hostility increases in a market, the payoff in the form of improved financial performance is also increased (Miller, 1993) On the other hand, when hostility is intensified, the profits to be gained decline because the firm has to work harder at building a strong market position, establishing its brand name recognition, and developing customer loyalty (Williamson, 1997).

In an environment characterized by increasing levels of intense hostility, it also becomes more difficult to gain additional market shares. Firms also have to engage in costly innovation and advertising and marketing to protect their market positions. Although Environmental Hostility may positively influence company performance, the relationship may not be linear. Prior research indicates that excessive entrepreneurship can reduce the firm's profits (Miller & Friesen, 1984).

The effect of Environmental Hostility has been found to vary in SMEs across industries, and turbulent environments are considered especially prevalent in industries involving high knowledge intensity (Kuivalainen, et al., 2004). Therefore, inter-firm relationships and the role played by the executives can help such firms in order to adapt more easily under these kinds of uncertainty. Investing in networks is essential in order to alleviate perceived hostilities in political and market terms.

Environment have often been characterized by the hostility, the dimensions of dynamism and heterogeneity. In response to intense hostility, marketing differentiation strategy has been widely used (Miller, et al., 1988).

Given that organizational network competences have not previously been linked to internationalizing SMEs facing environmental hostilities, although this is likely to be relevant to smaller internationalizing firms in particular. Martins & Pinho (2010) said whereas exporting SMEs perceived issues such as logistics as their biggest barriers in foreign markets, non-exporters emphasized the hostilities arising from market and governmental environments.

A hostile environment leads to further cooperation between firms, and thus to better performance (Matanda & Freeman, 2009), so that a hostile can lead to additional networking, which helps to weaken the perception of hostility through the mutual exchange of knowledge.

2.1.3 Introduction to Effectuation

Effectuation is a proposed new theory of entrepreneurship (Saravasthy, 2001) used in the new venture development process by entrepreneurs. Considering that "An awareness of the actions and behaviours of entrepreneurs is critical to understanding an entrepreneurial economy" (Chandler *et al.*, 2011, p.375), is very important an understanding of the Effectuation theory and the differences between other approaches of entrepreneurial processes.

This theory is considered a viable theory by many scholars as (Fisher, 2012) , who believes Effectuation is one of the few viable alternative theoretical perspectives describing entrepreneurial action, whereas many others do not as (Perry , et al., 2011), who conclude that effectuation has yet to be properly tested.

Effectuation processes are consistent with emergent (Mintzberg, 1978) or non-predictive (Wiltbank, 2006) strategies and include a selection of alternatives based on loss affordability, flexibility and experimentation which are carried out under conditions of uncertainty. Under these conditions, there is no workable way to calculate an expected return for an action, therefore the entrepreneur selects alternatives based on loss affordability through exerting control over the future by establishing alliances with, and getting pre-commitments from, potential suppliers, competitors, and customers.

On the other hand, can be found the processes based on causation methodology which are those consisting in planned strategy approaches (Ansoff & Mc Donell, 1988; Mintzberg, 1978); including such activities as opportunity recognition and business plan development (Chandler, 2009).

(Chandler *et al.*, 2011) describes Effectuation as a formative, multidimensional construct with three associated sub-dimensions (experimentation, affordable loss, and flexibility). An additional dimension is shared with the causation construct (pre-commitments). Being Effectuation

considered as a formative construct, implies that causality flows from the sub-constructs to the latent construct.

It is also shown the negative association between causation and uncertainty, as it was previously said by (Saravasthy, 2001). On the other hand experimentation, which has been defined as a sub-dimension of effectuation, is positively correlated with uncertainty.

Effectuation is given as an improvement in representing a specific phenomenon. The process of effectuation is began when the entrepreneur faces a context of uncertainty and with resource restriction. In this context, he can decide whether take the effectual process or not. If he does, the process ends with a new market artefact.

The effectuation process can be divided in three parts. According to literature of Effectuation theory (Dubin, 1969), the process can be divided in three stages: the core process, the factors affecting the process and those in the secondary process.

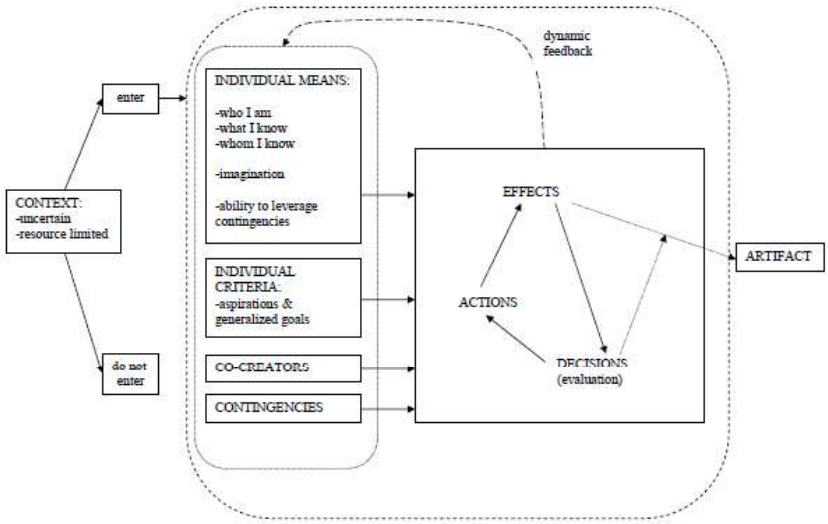

Figure 1: Effectuation as a New Proposed Model of Entrepreneurship (Arend, et al., 2014).

The core process begins when a balance is reached in which the assumption of the available means of the entrepreneur produces effects in line with the initial aspirations, thus taking into account

some tolerance in the loss of potential of the invested means. Actions are taken to produce realized effects.

Firms, markets and economies could be considered artifacts which are originated from the entrepreneur's decisions process leading to an effect which might be a successful business. To reach an intended effect, the entrepreneur should use his available means and other inputs. This use of means are called actions which can emerge from entrepreneurs' imagination (Read & Saravasthy, 2005).

During this process, the entrepreneur has to carry out several decisions, classified in two types. Decisions influenced by how much loss is affordable, an acceptable risk, are directing actions and decisions determining when to stop the process evaluate outcomes.

When entrepreneurs use effectuation processes they experiment with alternatives in which potential losses in the worst-case scenario are affordable, they use pre-commitments and strategic alliances in an attempt to control an unpredictable future, and they remain flexible so they can take advantage of changing environmental contingencies (Chandler *et al.*, 2011).

2.2 Developing the research question

In order to study the Collective Identity, the Collective Self-Esteem Scale (CSES) is used in the survey. According to the results obtained by (Luhtanen and Crocker, 1992), CSES is composed by four sub-scales (Membership esteem, Private collective self-esteem, Public collective self-esteem and Importance to identity). Considering the results obtained after Exploratory and Confirmatory factor analyses, CSES is a second order construct composed by 4 factors.

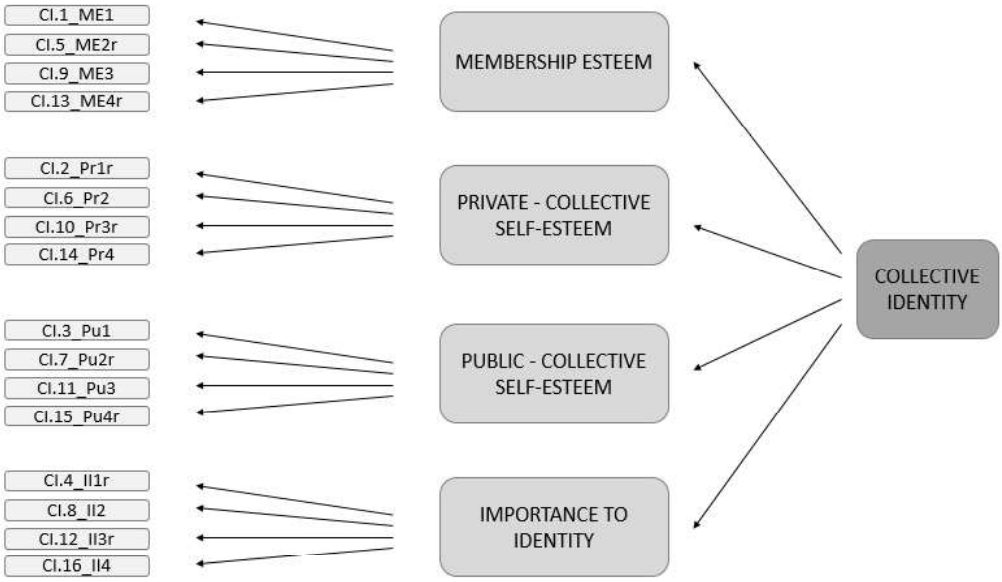

Figure 2: Collective Identity Construct (Type I) based on (Luhtanen and Crocker, 1992).

This scale, taking into account Breckler and his colleagues' (Breckler, et al., 1986), contains items involving individuals' judgments of how good or worthy they are as members of their social groups and similar in character to the collective ego task esteem items in (Breckler, et al., 1986) scale (See **Table 1** for a complete list of the items).

This conceptualization has been used in the survey in which four components have been reversed. Membership subscale assesses the most individualistic part of social identity. Private collective self-esteem, Public collective self-esteem and Importance to identity are more directly relevant to SIT.

Private collective self-esteem items try to assess one's personal judgments of how good one's social groups are. On the other hand, public collective self-esteem items assess ones' judgements on how other people evaluate one's social group. Finally, importance to identity assess the importance of one's social group memberships to one's self concept (Luhtanen and Crocker, 1992). On the other side, Membership subscale had the highest correlation with personal self-esteem (Rosenberg, 1965).

With regard to the Environmental Hostility construct, the items belonging to the scale has been extracted from a scale developed by Torkkeli and Puumalainen (Torkkeli *et al.*, 2011) in which they persuaded to study the effect of network competence and environmental hostility. Specifically, these items belong to the measure of international performance where a sum of several measures, objective and subjective, are analysed in order to take into account the degree of internationalization of the firms and their success in achieving the set strategic goals for internationalization. Exactly 5 items measured environmental hostility and were as follows:

- "Access to capital is difficult."
- "Products become obsolete quickly."
- "Bankruptcy among companies in the industry is high."
- "Demand for industry products is declining."
- "Our company must often change its marketing practices to keep up with the competitors."

The first four of these items encompass regulatory, technological, competitor and customer hostility, respectively. Although several indicators of perceived hostility have been used in prior research (Dess & Beard, 1984), the measures developed and validated by (Miller & Friesen, 1984) were employed in the study carried out by (Zahra & Garvis, 2000). The last item was adapted from (Naman & Slevin, 1993).

Concerning to the 4 first items, these were established by questions asked to executives for the purpose to evaluate their foreign markets.

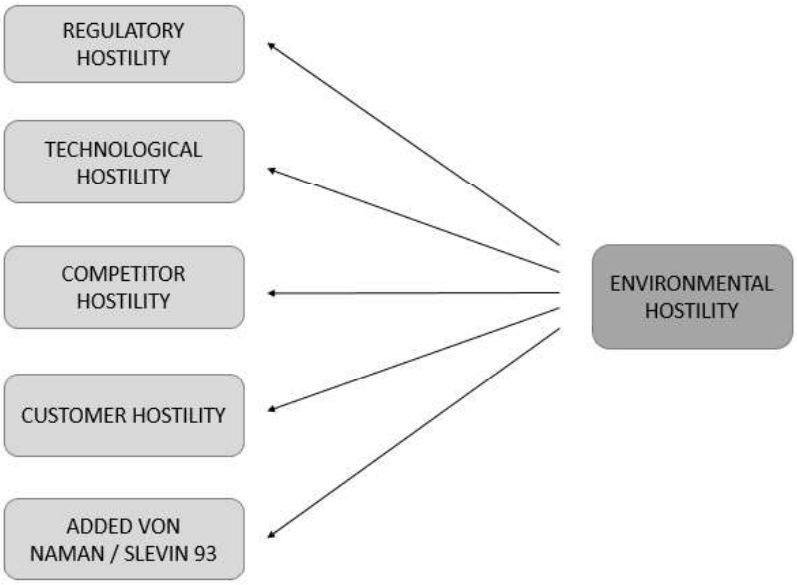

Figure 3: Environmental Hostility construct based on (Torkkeli et. Al, 2011).

On the other hand, Effectuation, as it is said above, is defined as a second order formative construct, formed by four reflective sub-dimensions. The items which are included in the survey have been extracted from the measures of studies carried out by (Chandler *et al.*, 2011).

As Effectuation is formed by 4 lower order constructs, a scale is developed to capture the Effectuation construct. 16 items have been established, four belonging to each sub-construct. One of the items of (Chandler *et al.*, 2011) have been reversed and 3 more have been added to obtain a total amount of 16 items.

The items come from surveys in which entrepreneurs were asked to "consider the start-up phase of your venture and indicate the degree to which you agree or disagree with each of the following statements."

Experimentation, like the other three sub-dimensions, is a four item scale developed from description of (Saravasthy, 2001) and the work of (Brown & Eisenhardt, 1997) which defines the fact of focusing on short term experiments. In this sub-scale, *"The product/service that we now provide is essentially the same as originally conceptualized"* item has been reversed.

The second sub-dimension, Affordable Loss, consists in four items, three extracted from (Chandler *et al.*, 2011) and the one left added later. These items are focused on predetermining the amount of affordable loss and choosing strategies within those given means (Saravasthy, 2001). In this case, an extra item based on (Brettel, et al., 2015) have been added as a complementary information in line with the previous items in which is combined the managerial and employee vision "*As the managers of this company, we consider it important that both we ourselves and our employees try to limit the potential loss of initiatives to an acceptable degree."*

To measure flexibility, (Chandler *et al.*, 2011) developed a four item measure which reflects the extent to which entrepreneurs remained flexible.

The fourth aspect, Pre-Commitments, is formed by four items, two of them from (Chandler *et al.*, 2011) and other two from (Brettel, et al., 2015) what emphasizes precommitments and strategic alliances to control an unpredictable future.

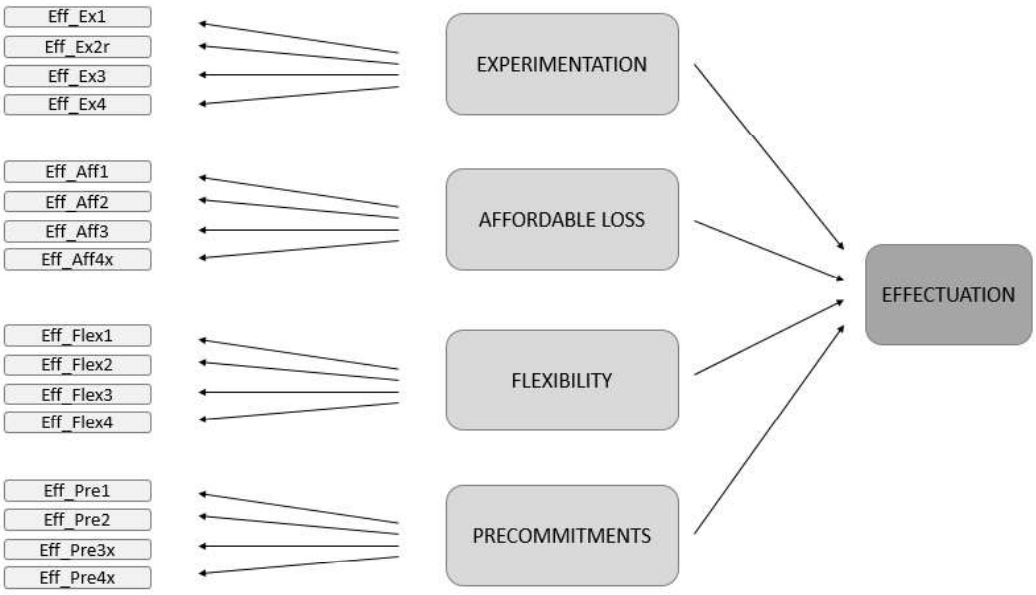

Figure 4: Effectuation construct (Type II) mainly based on (Chandler et. Al, 2011) results.

A part of the constructs before mentioned, a four-items marker construct, defined as reflective have been also added in order to assess the data and detect unengaged respondents. Specifically, the construct is about the Blue Attitude, developed by (Miller & Chiodo, 2008).

Finally, several control variables were added to the analyses. In order to controlling for firm, size (number of employees), year of foundation and industry variables were included. In order to obtain personal details, variables like age, gender and type of education were asked.

In order to assess the impact of Collective Identity, this study requires a procedure in which factor analysis are done. When a factor analysis is implied, the sample size plays an important role. It is known that larger samples tend to provide results such that sample factor loadings are more precise estimates of population loadings and are also more stable, or less variable, across repeated sampling (Khalid, 2010).

A wide range of recommendations regarding sample size in factor analysis has been proposed. In terms of minimum sample size in factor analysis, according to the rule of 100, (Gorsuch, 1983; Kline, 1979) recommended at least 100 respondents. Furthermore, no sample should be less than 100 even though the number of variables is less than 20 (W.A. Arrindell, 1985). In (Arrindell & Van der Ende, 1985, p. 166) is also suggested by different authors the rule of 5, that says that the subjects-to-variables ratio should be no lower than 5. Here is also reported the number $N = 50$ as the number to be the minimum to yield a clear, recognizable factor pattern based on a data set that has 16 variables, which represents a STV ratio of 3:0.

Taking these findings into account, Effectuation and Collective identity construct are composed by 16 items, what would be in the lower limit of the ratio 3:0. Despite of it, the results obtained in the factor analysis do not show a recognizable pattern and not confirm what in the previous literature was assessed.

Therefore, it is considered the sample size is not adequate and as it is done in (Koeske & Koeske, 1989) the data is considered validated and well documented in the previous research (Torkkeli *et al.*, 2011) and therefore, it can be used for further research.

2.2.1 The Research model:

Effectual Performance, what could be considered as an Effectuation strategy, defines the entrepreneurs' actions and one of the few viable alternative theoretical perspectives describing entrepreneurial action, and (Fisher, 2012).

Effectuation is offered as an improvement in representing a specific phenomenon, as in the case where an entrepreneur with few resources acts to create a new successful firm in an environment characterized by uncertainty (Saravasthy, 2001).

The effectual process begins with the entrepreneur confronting the context characterised by uncertainty and a restriction of resources and deciding whether or not to engage in that process.

Therefore, in a first step is going to be assessed how a strategy based on an effectuation process can be affected by the hostility of some markets.

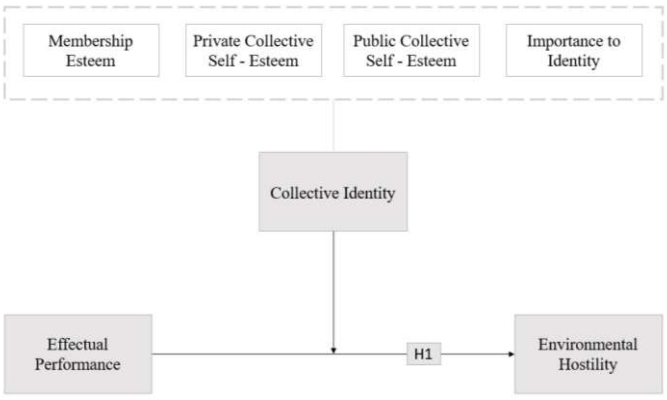

Figure 5: Research model to study.

Direct effects:

Effectuation, like Causation, have been proposed as alternative new venture creation processes applied by entrepreneurs, suggesting that they have to invent better ways to predict the future and develop devices in order to adapt more easily to their environment.

H1. *There is a positive relationship between Effectuation and Environmental Hostility.*

According to (Saravasthy, 2001) in a context of uncertainty, more affinity from entrepreneurs to apply Effectuation processes, what leads to use experimentation methods. According to this, entrepreneurs who perceive an environment as hostile, are more done to use experimentation in their activities.

H2: *Exists a positive relationship between Environmental Hostility and Experimentation.*

Moderated Effects:

(Chandler *et al.*, 2011) suggest that precommitments may be important for Effectuation processes because the entrepreneur uses pre-commitments to reduce uncertainty. The entrepreneur also utilizes experimentation, flexibility and tries to control the future by making alliances by getting pre-commitments from, potential suppliers, competitors, and customers.

Private collective self-esteem measures personal judgments of how good one's social groups are (Crocker, et al., 1994). On the other hand, Public collective self-esteem assesses one's perception of how positively other people evaluate one's social group (Luhtanen and Crocker, 1992). These personal characteristics are fundamental in order to develop new relationships in new markets as it is in the way of self-confidence to decide to enter in a new market.

Therefore, it is thought that entrepreneurs who perceive a hostile environment are more disposed to develop relationships with other entrepreneurs in the existing market in order to decrease the perceived hostility. Furthermore, earlier studies indicating that the ability of firms to manage business relationships opens up new avenues through which to internationalize and perform in

foreign markets (e.g., (Hanna & Walsh, 2008; Mort & Weerawardena, 2006)). Investing in networks is essential in order to alleviate perceived hostilities in political and market terms.

H3: *Environmental Hostility is highly perceived by those who have established pre-commitments.*

Entrepreneurs with high Collective Identity are more likely to have more goals, a greater belief in expected accomplishments as well as a better future, higher affinity to personal development as well as innovative approaches, and a higher personal commitment. According to this, managers who are defined with high importance to identity, those who give importance of one's social group memberships to one's self-concept (Crocker, et al., 1994), are more likely to perform better in uncertain markets.

H4: *Importance to identity dampens the negative relationship between Effectuation and Environmental Hostility.*

Earlier research has also indicated that a weaker perception of market hostility enhances the internationalization process in general (Zahra & Garvis, 2000), and in the network context in particular.

Multigroup Effects:

It is known that the number of female managers are still lower than male managers. According to a report carried out in 2017, the percentage of managerial positions occupied by women reached 25% for the first time worldwide, standing at 26% in Europe and 22% in the G7 (Grant Thornton Consulting, 2018).

On the other hand, the study carried out by the business accelerator MentorDay, suggests that more than 60% of women entrepreneurs find it difficult to have experts to help them finance their projects (MentorDay, 2018). It also reveals certain characteristics on women entrepreneurs' activity (e.g. a greater need for a mentor to advise them; the majority discard financing with

business angel partners, seeking alternative financing through subsidies and microloans; they prefer proximity businesses, discarding internationalization because of the high risk involved...).

It is for this reason that it is established that the environmental hostility perceived by women will be greater in women than in men.

H5. *The positive relationship between Effectuation and Environmental Hostility is stronger for females.*

As it is previously described, Environmental Hostility may relate to industry and market characteristics, such as governmental actions and highly dynamic and competitive market conditions (Kuivalainen, et al., 2004; Zahra & Garvis, 2000; Covin & Slevin , 1989). These hostilities are more likely to appear in industries which implying high knowledge intensity (Kuivalainen, et al., 2004) and those with technology whose products are more probable to get obsolete more quickly. According to this, these industries must apply Effectuation in order to avoid these hostilities.

H6. *The positive relationship between Effectuation and Environmental Hostility is stronger for industries related to technology.*

A business incubator is described as an entity that provides entrepreneurial tenant firms with critical resources such as counselling, office space, and other relevant infrastructure (Allen & Rahman, 1985; Høvig, et al., 2018). Furthermore, many business incubators aim to provide network resources and to stimulate the sharing of ideas, but some previous research has assessed that limited knowledge exchange takes place between incubated firms (Chan & Lau, 2005; Battisti & Mcadam , 2012). Since entrepreneurs taking an Effectuation approach are less focused on achieving a predefined goal (Fisher, 2012), it is also likely to assume that they are more willing to share information and resources that others may consider confidential (Goel & Karri, 2006). Entrepreneurs applying an effectuation approach have a high proclivity to form networks (Saravasthy, 2008; Chandler, 2009) which is one of the advantages that incubator context facilitates through the presence of other entrepreneurial firms with potentially compatible

resources available. Therefore, it is supposed that those entrepreneurs who had access to incubators must exhibit an Effectuation approach.

H7. *The positive relationship between Effectuation and Environmental Hostility is stronger for those entrepreneurs who had access to incubators.*

In order to assess the impact of Collective Identity on the relationship between Effectuation and Environmental Hostility, a survey was delivered to several German SME. In this survey various aspects were analysed through the questions. Aspects like: the situational context as well as various interactions that influence company founders; which factors encourage company founders to operate successfully in uncertain markets and which prerequisites can be created; and how inexperienced founders can take advantage of this approach and how it can be promoted or inhibited are studied in the survey and allow to analyse the three constructs: Collective Identity, Effectuation and Environmental Hostility. Both the survey, consisting of 7-Likert Scale type items and the analytical process applied are explained in greater detail in the following chapter.

3 Own research

3.1 Methodology

The empirical data to be used in the research was collected during the months of December 2017 and January 2018. The survey was sent to various German SME belonging to sectors as automotive, IT, electronics, medical, financial, etc… Questions related apart of collective identity, effectuation and environmental hostility were asked. Fifty out of all respondents were considered in the study. The respondents were told their participation would actively support a research project on relevant influence factors related to entrepreneurial acts in founders. They were informed the information provided by them were for purely scientific purposes and would be treated in a strictly confidential and anonymous manner. Participants were strongly requested to read carefully the questions and not leave a question unanswered.

Their responses were measured using seven point Likert-type items in order to estimate the degree of agreement of the participants with the questions. The scale ranged from 1 which meant *not at all* to 7 that meant *very much.*

The questionnaire consisted of different sections where some questions were quite similar for methodological reasons. In the first section, Effectuation, Access and Social Identity questions were asked. Specifically, in this section items related to Effectuation were asked in order to estimate their own behaviour. Respondents were requested to consider the start-up phase of their venture and indicate the degree to which they agreed or disagreed with each of the statements established.

In this same section, the people surveyed were asked about the social groups with which they identified themselves.

In the section followed, aspects associated to Environmental Hostility and Passion were consulted. In particular, participants were asked to assess the industry and environment that they

were operating in through items in relation with environment and entrepreneurial activities and thus the third construct of the study, environmental hostility could be studied.

On the other hand, following sections covered different aspects concerning to Networking Capability and Social Media, Burn-Out Probability and Psychological Safety, Core-Self Evaluation and control variables.

Precisely, a marker variable subsection was remarked as highly important to answer because of the methodology. In this subsection, four questions related to the blue colour were formulated to detect unengaged respondents.

From the general information of the survey, both about the company and themselves, important information was extracted. Of those who answered the survey, 38 (76%) were male, belonging to companies with a mean value of full-time employees of 52, ranging from 0 to 440. The average age of interviewed people were of 31.67 years.

3.1.1 Data screening

3.1.1.1 Missing data

A total amount of seven answers correspondent to the three constructs weren't answered by three different respondents. Respondent 19 didn't' answered to the question CI15. Respondent 34 didn't answered to Eff_Ex4 and 28th didn't answered the five questions related to Environmental Hostility.

The threshold for missing data is considered flexible. As the missing data in all the cases represents less than a 10% per variable, there is no a problematic variable. According to this, there are several options to deal with this issue.

First of it, as the missing data represents less than a 10% of the total dataset, this missing data could be removed and not considered. The other option, which is the chosen, is impute the missing values due to the responses are in one interval (Likert-Scale responses).

The dataset contains three respondents who did not answered one or more questions. For those who did not answer one question (respondents 19 and 34) the data is imputed manually according to what they answered in the related questions. On the other side, as the respondent number 34 did not answer all the five questions related to Environmental Hostility, an estimation of his possible answer cannot be done. Considering the data is Likert-type, and the values are in ordinal scale, the most common option is median replacement, because means are less meaningful in these situations and avoid creating a bias. Therefore, it has been considered adequate to use the median replacement to fill these five missing values.

In the case of the respondent nr. 34. He did not answered to the question "*We tried a number of different approaches until we found a business model that worked*". This question is classified in the Effectuation Experimentation. Effectuation contains 16 questions in 4 groups. As the respondent answered the other 15 questions, the data missed has been answered considering the answer to the other 3 questions to Experimentation. In this case it has been quite easy due to the 3 left answers were rated with a 5. According to these answers the missing value is filled with a value of 5.

In reference to the respondent nr. 19, the missing value belongs to the Collective Identity concept in a Public Collective Self-esteem aspect. In this case, the participant did not answered the question *"In general, others think that the social groups I am a member of are unworthy*". According to what he answered in the related questions, this value has been filled with a value of 4 which shows a neutrality to the answer.

Finally, for the case of the respondent nr. 28 who did not a whole group of questions related to Environmental Hostility, it has been decided to replace the missing values through median replacement method. Median values have been calculated for the rows with no missing values.

Specifically, the values imputed to the belonging questions are the following:

"Access to capital is difficult" has been rated with a value of 5.

Products become obsolete quickly has been rated with a value of 3.

Bankruptcy among companies in the industry is high has been rated with a value of 4.

Demand for industry products is declining has been rated with a value of 2.

Our company must often change its marketing practices to keep up with the competitors has been rated with a value of 5.

Regarding other questions related to the general information, a major number of respondents skipped some questions. Therefore, only the most important aspects and those which did not have more than 5 missing values (10%) or not properly introduced (i.e. Total turnover, Identification with others…) have been filled with the mean value for the continuous variables and with the most answered in the dichotomous. It is the case of the age, foundation year and number of employees and some other.

For example, respondent 19, did not answered the year of foundation nor the number of employees. Therefore, those values were imputed with the mean value and were 2015 for the foundation year and 52 employees.

In the case of the age, two of them did not answered. Respondents 19 and 38. The first intention has been to search for information of the respondents from the company in order to get the exact data, but it was not easy. Thus, the missing values have replaced again with the mean. Then, the new values for the age of respondents 19 and 38 are, 32.

In the case of the total turnover, eight out of fifty respondents didn't answer. Of those 43 other respondents, 13 reported a total turnover of zero which is not very reliable. Therefore, this variable has not considered as a control variable.

Finally, such the variables accepted as a control variables for the regression method (i.e. Year of foundation, number of employees, age, gender…) as the variables discarded appear on the Table 10.

3.1.1.2 Outliers

After imputed the missing data, it is interesting to have a look at the possible outliers. Outliers can influence the results obtained in the analysis. Two types of outliers are considered: outliers for individual variables, and outliers for the model.

As the data explaining the different constructs is Likert-scale type, it is included in a range between 1 and 7. As it has a minimum and maximum value, there are several discrepancies within consider outliers or not. As it is said, lastly, outliers do not really exist in Likert-scales. Answering at the extreme (1 or 7) is not really representative outlier behaviour.

Despite this, outliers can appear in the given dataset for the continuous variables, containing values like age, number of employees, year of foundation, years of education…a descriptive statistical analysis has been run using SPSS in order to detect the possible outliers. The process to detect these outliers consists in analysing when the value obtained is more than what is considered within the 'norm' in sample. This use to happen when the response is more than 3 standard deviation away from the mean. After the analysis, no outliers have been detected (See Table 2 & 3)

Unengaged responses:

The other type of outlier, the correspondent to the model appears when there is an unengaged respondent. There are several methods to detect an unengaged respondent. These participants answer the questions following a pattern, as answering the same value to all the questions or consecutive values.

Visually, some of the respondents could be considered as unengaged respondents. They have answered several consecutive questions with the same value but finally that has not been considered as an unengaged respondent. Furthermore, the calculation of the standard deviation has not shown a relevant value to consider them unengaged.

Here is also a marker variable containing coded items. These questions correspond to Mark_x where four questions related to colour blue are asked to detect the attention that respondents are paying and help to detect a possible unengaged participant.

According to this, it would be reasonable that people whose answer to *I prefer colour blue to other colours* is on a positive way, their answer to *I like blue colour* would be it too as the people who like blue clothes and hope their next car would be blue, they also would like colour blue. Therefore, once inspected those responses, no respondents have been considered unengaged.

3.1.1.3 Normality

Through an analysis of the ordinal variables using sktest and saphirowilk using the program STATA, it is possible to see if they are normal values or not. Sktest is more powerful in comparison to skwil in these number of variables. Both methods have been applied.

According to this, considering a 5% result, sktest shows that there are 11 variables skewed and 11 with kurtosis too. Despite of it, some of them are in the limit. Considering saphirowilk test, 13 variables values do not follow normality.

On the other hand, a skewness and kurtosis test has been carried out using the SPSS program for the indicators of the latent factors and several variables of general information (e.g. age, year of foundation, total of employees…) and taking a look at the threshold of a value of 1. Here is observed that most of the indicators show normality in terms of skewness, only four are mildly above the threshold in absolute terms (e.g. Eff_Pre3x, CI6_Pr2, CI11_Pu3 and Ehost_4). The

total number of employees and the age are also above the threshold value of 1. Despite of it, other researchers are more flexible and allow up to a +-2.2 threshold. Considering this threshold, the only variable which would be above the threshold is (Total Employees) which would be positive skewed, weighted to the right.

Regarding to the kurtosis, ten of the indicators of the latent variables (LV) as the two said before of the general information, present kurtosis. The maximal kurtosis value has been of 1.518 for the indicators (CI11_Pu3) and 7.366 for the number of total employees. Despite of it, all the variables are under the threshold of 3.3 established by (Sposito, et al., 1983) and what is more, do not exceed the value by three times the standard error. This means, the kurtosis is not significantly different from that of the normal distribution. Therefore, only the variable accounting the number of employees, would have kurtosis issues.

In the variables which results differed through both methods or the hypothesis is not completely clear, an exploratory analysis have been carried to decide whether it is normal or not.

Finally, after the results obtained in SPSS, the mentioned variables have not been modified. In line with it, (Micceri, 1989) argues that non-normality of data is far more common than researchers are aware and must be accounted for in the analysis.

3.1.2 Exploratory Factor Analysis

As it is previously explained, the sample size is not adequate in order to obtain proper results to assess the factor structure measuring all the items of the scale, but therefore each construct has been explored independently as it is done in (Chandler *et al.*, 2011).

Some researchers suggest to carry an Exploratory Factor Analysis (EFA) followed by a Confirmatory Factor Analysis (CFA) (Teddlie & Tashakkori, 2009; Gaskin, 2012) while others bet for doing directly a CFA based on previous theory and empirical research (Suhr, 2006).

Despite of having the scales assessed by previous literature (Luhtanen and Crocker, 1992; Chandler *et al.*, 2011; Torkkeli *et al.*, 2011), an EFA has been conducted in order to explore the results that appear and compare it with the previous literature, before to proceed with the CFA.

Constructs studied are considered as first-order (Environmental Hostility) and second-order (Effectuation and Collective Identity). In the case of the second-order constructs, they are different classified depending on the reflective or formative mode of their dimensions. For this concrete study, two types of constructs are defined, Effectuation is a type II construct in which the first order terms are reflective and the second order term formative, and on the other hand Collective Identity is defined as type I, reflective in their both dimensions. This characterisation will influence the methodology applied in the analysis.

Moreover, as the constructs studied contain higher order factors, the sub-dimensions of these dimensions could load all together. Therefore, following the recommendations of (Gaskin, 2012) a separate EFA for the items of second order factor have been carried out using a Principal Component Analysis extraction and Promax rotation.

The followed procedure has been applied to the three constructs. It has been done using STATA and SPSS programs simultaneously in order to compare and assess the results.

Regarding to Effectuation construct, in the first step, a display of correlations of variables and coefficients and a display of all pairwise correlation coefficients has been applied to detect highly correlated coefficients.

Then, a scree analysis of the eigenvalues (Cattell, 1966) is used to determine if the number of factors to extract from the data matches with the literature (Chandler *et al.*, 2011). On the first moment, more than the four expected factors reveal an eigenvalue above the threshold of 1. Despite of it, the extraction method has forced to extract only four as it is established in the literature.

Subsequently, the sampling adequacy has been studied by applying the Kaiser–Meyer–Olkin (KMO) measure and Barlett's test of sphericity. The KMO is suggested to be greater than 0.50 to be considered as acceptable and the Bartlett's test must be significant ($p < 0.05$) before proceeding with factor analysis (Arnold, et al., 2007; Barlett, 1950; Kaiser, 1970) to discard the correlation matrix is not an identity matrix. Firstly, both values are above the threshold, then, an iterative analysis has been run until the cut-off values of the factors exceed 0.50 as suggested by (Hair, et al., 2006). Despite of it, some researchers as (Gaskin, 2012) suggest to the smaller the sample size, the higher the required loading. In this case, the sufficient factor loading for a sample size of 50 would be of 0.75 but these values are not obtained for the convergent validity.

After conducting this analysis, two items have been deleted (Eff_Pre4 and Eff_Flex4). This depuration has extracted four factors, whose eigenvalues exceed the unity value, and allowed to increase the variance explained by the different factors (65.54%). loading each of them in the corresponding factor. These values range from 0.571 to 0.913.

Once the iterations to get the best factor loadings, is done, the final KMO value obtained is 0.601 which is a mediocre assessment, but acceptable, and a significant and Bartlett's test (chi-square 246.356 p-value < 0.001). As it is pretended to get the Barlett's test significant, the P-value confirms it and indicates there are sufficient intercorrelations to conduct the factor analysis and it is appropriate. This also explains the reflective model.

In addition to this, discriminant validity and scale reliability has been assessed. Discriminant validity refers to the extent to which factors are distinct and uncorrelated. It is supposed that variables should relate more strongly to their own factor than to another factor. The method used is by exploring the factor correlation matrix, where the correlations between factors could not exceed the threshold of 0.70, what means a share variance below 49%. In this cases, no items exceed this threshold, and the maximum correlation value is 0.211.

In case of scale reliability, it is done by computing the Cronbach's alpha. This value refers to the consistency of the item-level errors within a single factor and should be above 0.70, what is lightly obtained here with a value of 0.714.

Once finished the EFA for Effectuation, it has been applied to Environmental Hostility by following the same procedure.

The screeplot for Environmental Hostility reveals only one factor with an eigenvalue above 1. It is coherent due to its reflective first order characterisation. Data is considered appropriate because of the KMO value (0.704) and the Barlett's test of Sphericity (chi-square = 34.068; P-value < 0.001).

All items load with loadings above 0.50 ranging from 0.510 to 0.721. Furthermore, the scale reliability scores 0.665. It is a little below the threshold established of 0.70 but as the scale is already assessed in previous literature (Torkkeli *et al.*, 2011) and there are only 5 items in the scale, this is not an issue (George & Mallery, 2003).

Finally, the exploratory analysis is conducted for Collective Identity construct. Using the principal component factor, 3 factors are extracted using the eigenvalue above 1 extraction method. As the 4th eigenvalue loads with a value of 0.96 it is decided to force to extract 4 factors in order to match with the dimensions established in the construct (Luhtanen & Crocker, 1992). After this deleting, a Principal component factor analysis is run again applying a Promax rotation and Kaiser normalization. Once that is got, the proportion of the variance accounted for the first factor corresponds a value of 41.01 per cent of a total 71.08 of the four items, which is below the 50% suggested threshold to assess not Common Method Bias (CMB) as Harman's Single Factor test (Neumann, 2018). Despite of it, many authors argue that this method is almost obsolete, and further analysis in the CFA are required to detect common method bias.

In order to assess the adequacy of the sample, the (KMO) value scores above 0.70 (0.777) what indicates a middle adjustment. Barlett's test of sphericity is significant (chi-square = 468.806 ; p-value < 0.001).

Regarding to the factor loadings, no items have been deleted. Items with loadings smaller than 0.40 are established to not appearing in the pattern matrix. Unlike it was expected, some of the items do not load on the established factors as it is proposed in the literature and some items from two theoretically different factors end up loading on the same extracted factor. On the basis of the elements contained in the survey, at the moment of the factor analysis, when the items from two theoretically different factors load on the same extracted factor, lead to confirm these two factors are actually just two dimensions or manifestations of some higher order factor. Hence, during the CFA, a second order model must be constructed for theses higher order constructs and attention must be specifically paid to these items and its modelling. Nonetheless, the factor loadings obtained score above 0.50 (0.5758 to 0.8724).

As mentioned before, the items and dimensions belonging to a reflective construct are significantly correlated. Therefore, it is desired to have the variables some correlated but if they are too correlated they are not interesting because they are not uniquely contributing to explaining the data matrix. Observing the correlation matrix of rotated factors, none of the four factors exceed the threshold of 0.70 among them (max .value = 0.372).

Regarding the reliability of the scale, in this case Cronbach's alpha value is quite above the threshold and scores a value of 0.8947.

3.1.3 Confirmatory Factor Analysis

Confirmatory Factor Analysis is the following step after the Exploratory Factor Analysis. It is applied to confirm the factor structure extracted in the EFA or established in literature.

The CFA has been conducted using the AMOS program. This procedure has been done for each of the three constructs establishing the initial hypothesis structural models.

Effectuation construct has been the first construct analysed. The causal nature of the relationship, where the lower-order measures shape the upper-order construct (reflective-formative type II model), also suggests that the lower-level indicators are defining characteristics of the construct

and may therefore be independent of each other (MacKenzie, et al., 2005). This implies that the low order formative factors form a general concept that mediate the impact on corresponding endogenous variables but do not share a common cause among themselves (Chin, 1998) and it is not recommended to depurate (e.g. change or delete latent variables) because information is lost by eliminating items (Bollen & Lennox, 1991).

According to what was commented before in order to test hierarchical models, the two stage approach is applied to test the model. Here, the second order construct can be formed by specifying a construct that indicates all the indicators of the first order construct (Becker, et al., 2012).

The measurement model has been defined manually specifying the four latent variables and their belonging indicators. In the first step, the four latent variables have been related through co-variances. In the analysis properties, the output values selected have been (Modification indices, Residual moments, Standardized estimates, Factor score weights and Tests for normalities and outliers). Once the model was defined, the analysis were run and the results appeared. Contrary to what was expected, the solution is inadmissible due to variances between the error terms of Eff_Flex3 and Eff_Pre1 are negatives and Heywood cases appeared. The apparition of Heywood cases can be explained by the not satisfactory result obtained on the EFA and because of the correlation between the two latent factors. A solution to this case is to establish a common string constrained on both indicator paths as a regression weight. As the same label name is established, it forces to AMOS to be equal when they are unstandardized results. Despite of it, the corresponding modifications were applied and the analysis repeated.

Once the solution worked and the Heywood cases disappeared, results show the degrees of freedom are larger than zero, which indicates that the model is identifiable. In order to estimate the model parameters, the minimum was achieved. Taking a look on the results, some re-specifications of the model are necessaries to improve the model fit. Despite of these modifications help to reach a better fit of the model, they can also mess up the calculation. These changes consist on co-varying the error terms of every latent factor among them. These

modifications are applied based on the Modification indices whose threshold were established in a value of 4.

After applying the co-variances among the indicated terms, the model fit improved reaching a fairly fit even that they did not reach the threshold established. The results obtained assessing the model were a Chi-Square of 93.29, a P-Value over 0.05 (0.064) and a Comparative Fit Index (CFI) almost over 0.90 (0.897) which indicates a satisfactory fit as it is said by (Hair, et al., 2010) and (Awang, 2012) (Awang, 2012). Furthermore, values of Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA) provide a good fit for the model. The GFI value is between 0.90 and 0.80 and the RMSEA is 0.073 suggesting a good fit (Forza & Filippini, 1998; Greenspoon & Saklofske, 1998) . Nevertheless the threshold for the Standardize Root Mean Residual (SRMR) is considered adequate for a value of 0.10, here is obtained 0.107 which can be fairly accepted.

In the same way as the CFA procedure was done to assess the Effectuation construct, it was done for Collective Identity. The model was constructed with the four latent variables and 16 observable items. According to this, the analysis is run and the output reflects an inadmissible solution. The note for the model indicates that the covariance matrix among the first order variables is not positive definite. AMOS program can produce estimates of variances and covariances that yield covariance matrices that are not positive definite (Wothke, 1993). The analysis program does not attempt to distinguish between a solution that is outside the admissible region and one that is on or near its boundary. The inadmissible solution message indicates that some variance estimates are negative, or that some exogenous variables have an estimated covariance matrix that is not positive definite. It suggests either that the model is wrong or that the sample is too small (Joreskog & Sorbom, 1984). These issues have been tried to fix by changing the latent variable path constraint to another path or constraining the error variance to a small positive number but did not succeed. In this case, it is assumed that the sample size is not adequated to run the analysis and the scale is assessed in the literature (Luhtanen and Crocker, 1992).

In the case of the Environmental Hostility, the confirmatory analysis has been conducted. The measurement model has been specified with five indicator variables and one latent variable. As the degrees of freedom are larger than zero, it indicates that the model is identifiable. In the analysis properties, the output values selected have been (Modification indices, Residual moments, Standardized estimates, Factor score weights and Tests for normalities and outliers). In order to estimate the model parameters, the minimum was achieved, the solution converged resulting in overall chi-square of 4.887 and five degrees of freedom were obtained. No modification indices above the established threshold of 4 have appeared. The results obtained from the CFA show a significant P-Value (0.430) what assess the goodness of the model fit. All the other values obtained after running the first analysis are as expected but the RMR. RMR value scores 0.156 which is above the expected 0.05. According to this result, co-variances between the error items were added. Modification indices threshold were diminished, obtaining three modification indices from where the co-variance between error terms three and four (1.887) was the highest and subsequently added.

After this modification, a new analysis were run and some of the values showed a difference. As it was expected, the RMR value decreased to a value of 0.059 which could be accepted. On the other hand the rest of the values accomplish the required values. The p-value increased up to a 0.944 as the Chi-Square did it up to a 0.757. GFI and CFI have a value over the 0.90 (0.994 and 1.0) and the RMSEA scores less than the 0.05 required (0.0).

As all the results are like expected, the model fits and no more re-specification is required and the model is accepted.

The next step carried out is a continuation of what previously explored through the Harman's single factor test, the possibility to have Common Method Bias.

CMB explains the fact of the existence of bias in the dataset due to something external to the measures which could have influenced the response given by the respondent (Gaskin, 2012). There are several reasons for focusing on CMB. Mainly, the researcher's conclusions might be at

risk since the conclusions regarding the model's relationships may be erroneous (Eichhorn, 2014) The errors introduced by methods and tools could contaminate analytical results (Campbell & Fiske, 1959). The potential sources of CMB are several, but the most important in this case are classified as:

- Selection bias: The group of participants is not representative of the population as a whole. The participant may share similar characteristics in their groups that may not necessarily be evident across all categories of participants. The method to diminish this effect is by increasing the sample size.

- Subject effect: For example, in the case of CI, participants could be aware that their perceptions and experiences for their specific group was being assessed, then they might have answered questions differently than they would in more familiar situations (Rossouw, 2010).

Furthermore, three social threats are identify as influence in the data collection (Trochim , 2006).

- Hypothesis guessing: participants are likely to try to figure out what the study is about.

- Evaluation apprehension: many participants do not feel comfortable answering questions related to self-esteem truthful and expressing themselves. Therefore, some of them could not answer sincerely in order to be seen in a favourable manner.

- Researcher expectancies: the way the survey is explained by the researcher and the aim of the study can influence the answers of the participant because of the expectations he considers the researcher has.

In order to detect possible CMB, there a three methods which are the most frequently used. A part of Harman's test, which is the most simple and can be done in the EFA, exist two more. These two try to solve the weaknesses of Harman's method. This method is sensitive to the number of variables involved, becoming less comparative as the number of variables increases. Furthermore, the threshold established on 50% of explained variance does not determine

unequivocally the existence of this variance. Therefore, the Common Latent Factor (CLF) and the Common Marker Variable are assessed (CMV). As the CMV is mainly the same analysis as it is the CLF but lightly extended and more accurate. The difference yields on including a marker variable which the researcher supposes not to be correlated with the other variables.

As previously commented, the marker variable in this research consist on four questions related to the blue colour. Adding this construct allows to include measures presumed to influence the cause of the bias itself. As the paths to the CLF are constrained, (loading of the common method manifest variables are forced to be equal). In this case, the items of the blue colour construct should have low, or no correlation with the observed variables from the other LV.

In the Effectuation case, the maximum correlation obtained between the marker variable and Flexibility LV is 0.484, which is just below the heuristic threshold of 0.50. In the case of Environmental Hostility the correlation between the two constructs has a value of -0.617 what confirms the existence of bias. When applying this method to CI, when CI is modelled as a first order construct, the marker variable correlates on value of 0.43 with Importance to Identity LV. If CI is modelled as a second order construct, and covarying CI with the marker LV, the covariance has a value of 0.20. Despite of it, the model fit obtained with the CLF in this CFA is not valid because two error terms corresponding to Public Collective Self-Esteem and Importance to Identity have negative variances. This error have been solved by constraining the error variances to a small number (e.g. 0.0001).

Nevertheless, considering the results obtained through the different analysis, CMB can be considered in the data.

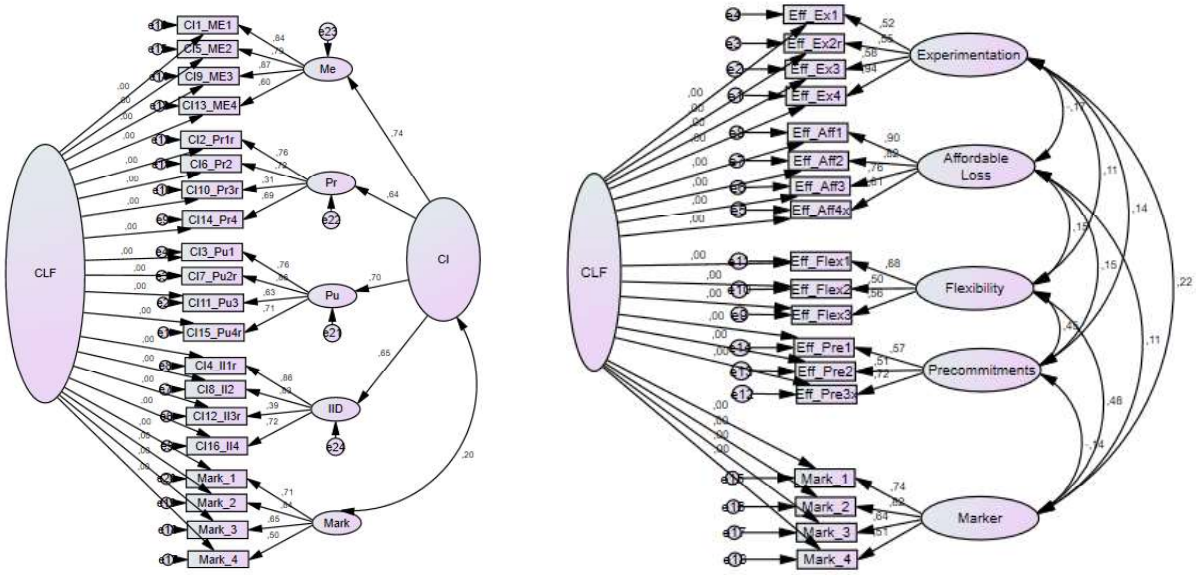

Figure 6: CMB analysis with marker variable in the CFA for CI.

Upon the model fit for every construct and CMB are checked, configural, metric and scalar invariance tests are being carried out. Through this test is intended to assess that the validity of the factor structure and loadings are sufficiently equivalent across groups (e.g. gender, classes on entrepreneurship). If the tests do not show up a good validity, it means that factors are not actually measuring the same underlying latent construct for the groups studied.

As it is said by (Gaskin, 2012), Invariance tests are done at the first-order level in order to determine if the latent factors are similarly constituted for multiple groups. Therefore, Invariance is relevant mainly to the relationship between the observed items and their immediate latent factor, so there is no need to test for invariance in the higher order relationships. According to this assumption, all the invariance tests have been carried out for every construct and for those of second order (e.g. Effectuation and Collective identity) have been done in their first order with that latent variables related.

The first case corresponds to configural invariance. It tests whether the factor structure represented in the CFA achieves a proper fit when both groups are tested together and freely. The process to assess this, is simply using in AMOS the measurement model previously assessed and create two groups which are interesting to split the data (e.g. male and female, took classes on entrepreneurship or not).

In this case, the data has been divided in two groups considering the gender variable. As it was said previously, 38 respondents are male and 12 female.

Taking this into account, the invariance test have been carried out for every construct. In the case of Environmental Hostility, the model fits when estimating per groups freely without constraints. The model fit values are a bit less adequate but they are still above the established threshold.

Unfortunately, in the case of the Effectuation, the invariance test did not succeed because of the apparition of some errors while attempting to fit the model. The error reported was that the sample moment matrix was not positive definite. The reason that may justify this error is that the observed variables are linearly dependent due to the small size of the sample. Specifically, the error appeared in the case of the female group in which the data size is 12.

The next step is to proceed with the metrical invariance test. In this case, the measurement model must be modified. The procedure consists on performing a chi-square difference test on the two groups previously defined and run it as before done in the structural model.

The result obtained assessing the metric invariance is positive as it is evidenced by a non-significant P-value and non-significant chi-square difference test between the fully constrained and unconstrained models.

Having passed the metric invariance, the invariance model measurement ends assessing the scalar invariance. This assessment assess whether intercepts and structural covariances are equivalent across the mentioned groups. In order to get the results, a multiple-group model is done where

estimating means and intercepts. Here measurement intercepts and the unconstrained model are useful to determine the scalar invariance.

Upon the test is run for Environmental Hostility, regarding to the model comparison, the P-value is larger than 0.05, which assesses the scalar invariance.

As the results obtained through this methodology are not very clear, a different process has been tried to apply. A particularly configuration of second-order constructs is a composite of common factors where the first-order constructs employ a reflective measurement model, whereas the second-order construct is a composite formed by the first-order constructs. This is the most frequently used approach in research in the social sciences (Ringle , et al., 2012).

To estimate models consisting of higher-order constructs, some approaches have been proposed. Two of them are the repeated indicators approach and the two stage approach. In the first approach, the manifest indicators of the first order constructs are reused for the second-order construct. The two-stage approach consists of two steps. The aim of the first stage is to obtain latent variable scores for the first-order constructs. In the second stage, the scores of the first-order constructs serve as manifest variables of the second-order construct. Furthermore, the two-stage approach allows to place the second-order construct in an endogenous position within the structural model (Ringle , et al., 2012) and helps to avoid multicollinearity among the indicators.

As it is suggested by (Gaskin, 2012) if the model is reflective-reflective, then the repeated indicator approach can be applied, there is no need to extract latent variable scores. This approach has been applied to Collective Identity. As AMOS program does not allow to use a variable twice, these variables have been duplicated in the database. Despite of this duplication, at the moment to run the analysis, errors appear because of the small sample data and no possibility to run the analysis.

On the other hand, the second order construct and the second stage approach has been used in order to assess Effectuation construct. Results are showed in Table 8 and the model fit is not as desired.

Finally, regarding to Collective Identity, all of the methods have been applied and none of them has extracted adequate results. If the model is modelled according to literature, three of the latent variables are highly correlated (correlation >1). As in first instance, it is not wanted to modify a validated scale, several modifications have been tried (i.e. deleting redundant items, correlate some items…). It has also been tried to consider the construct as a one factor construct but no model fit has been obtained after deleting more of the half items. Because of these results, and the aim to work with this construct, the Collective Identity model have been modelled in the CFA as it is established in the literature for his use in the regression.

Once defined the model, the first step is the evaluation of the measurement model for the convergent validity. In order to assess the measurement model, several aspects have been explored following the suggestions of Hair et al. (2011). The quality of the measurement has been assessed through the internal consistency reliability (composite reliability; CR), indicator reliability (individual and cross loadings), discriminant validity and convergent validity, using the average variance extracted (AVE).

AVE and CR have been manually calculated for the first order model and the second order model. Factor loadings have been used and path coefficients from the reflective 2nd-order construct to the lower-order constructs have to be used and introduced these as loading in the AVE formula (Becker, et al., 2012).

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + (\sum_{c=1}^{n} \delta_c)^2}$$

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i{}^2}{n}$$

Where: $\lambda: factor\ loading$

$\delta: error\ variance$

$n: number\ of\ observed\ variables$

It is established to have an AVE higher of 0.50 to accept the convergent validity (Fornell & Larcker, 1981). In this case, the 1st order constructs do not exceed this threshold except Affordable Loss. Regarding on second order, is far below the threshold.

When using the Master validity plugin of Amos developed by (Gaskin & Lim, 2016), for the second order model of Effectuation, results are the same as manually calculated. None of the values of CR and AVE accomplish the desired threshold. CR value is 0.386, quite below the cut off value of 0.70 and the AVE is 0.159. It is suggested to remove Precommitments LV to improve the model fit. After this suggestion, no improvement is obtained.

Collective Identity has been modelled as a second order construct. It has been firstly studied with all items and next two items (CI10 and CI12) have been deleted due to his low loading. The best result for AVE and CR was with all items, what lead to almost the threshold for AVE (0.464) and accomplished the CR threshold (0.775). Finally, EH construct has no obtained valid results for convergent validity test (Table 7).

3.1.4 Regression model

Once the Factor Analysis has been applied and the number of factors underlying the constructs have been identified, the information about the factors is used to create scores to represent each individual's placement on the factors established (Gorsuch, 1983). These factors scores with hypothesis tests, are used as a part of a regression analysis in order to determine how factor scores differ between the different groups.

There are two main classes of factor score computation methods: refined and non-refined. Non-refined methods are relatively simple, cumulative procedures to provide information about individuals' placement on the factor distribution. The simplicity lends itself to some attractive features, that is, non-refined methods are both easy to compute and easy to interpret. Refined computation methods create factor scores using more sophisticated and technical approaches.

They are more exact and complex than non-refined methods and provide estimates that are standardized scores.

One of the simplest ways to estimate factor scores for each individual involves summing raw scores corresponding to all items loading on a factor (Comrey & Lee, 1992). The sum score method may be most desirable when the scales used to collect the original data are "untested and exploratory, with little or no evidence of reliability or validity" (Hair, et al., 2006, p. 140).

Firstly, all items on a factor are given equal weight, regardless of the loading value. Therefore, items with relatively low loading values are given the same weight in the factor score as items with higher loading values. Finally, summing items is straight forward if simple structure is present.

This method does not involve item loading values in the computations. Weighted sum scores method allows to create the sum scores with the factor loading of each item multiplied to the scaled score for each item before summing. The advantage of this method is that items with the highest loadings on the factor would have the largest effect on the factor score. However, there are potential problems with this method (e.g. the factor loadings may not be an accurate representation of the differences among factors due to a researcher's choice of extraction model and/or rotation method). Therefore, as the Factor Analysis could not be properly validated, this method has not been applied.

According to this method, a multiple regression model with interactions terms has been carried out in order to assess the research model. In this moderated regression, the interaction terms consist of the product of the dimensions of the second order constructs.

To estimate the regression model to predict the dependent variable (i.e. Environmental Hostility), were entered first the independent variable (i.e. Effectuation), followed by the interaction terms and lastly, the selected control variables.

In the specific case of this study, the moderator variable is Collective Identity, previously defined as a second order latent variable. Second order latent variables were proposed by (Jöreskog, 1970) (Thurstone, 1947). Although comparatively rare, second-order latent variables in the Jöreskog-Thurstone sense have been reported in substantive articles (e.g. (Bagozzi & Heatherton, 1994; Dwyer, et al., 1987) but not commonly used as a second-order interaction (Ping, 2015).

Statistically, moderation is an interaction effect. Etymologically, interaction is a little more generic than moderation. Whereas interaction does not distinguish the role of the two predictor variables, moderation distinguishes between the roles of the two variables involved in the interaction (Grace-Martin, 2014), what interprets in one way. In this specific case, the moderator, Collective Identity, is the predictor that changes the effect of the Independent Variable, Effectuation, on Environmental Hostility, the dependent variable. The main interest is how Collective Identity changes the primary effect of Effectuation, on Environmental Hostility. Despite of it, mathematically there is no difference between both predictor variables and are entered in the same way into the statistical program.

For specifying a latent variable interaction exist several proposals (e.g., (Hayduk, 1987; Jaccard & Wan, 1995),etc.). The most commonly used specification in substantive articles was suggested by (Ping, 2015). When it is a first order latent variable, this specification uses a single indicator for an interaction, which is the product of the sum or an average of the indicators of the independent variable and the sum or an average of the indicators of the moderator.

When the latent variables are of a higher order, the possibilities for specifying the interaction are numerous, but most of them are impractical (Kenny & Judd, 1984). The specification described implies involving all the possible products between the indicators of both constructs. These product terms (e.g. Membership Esteem x Experimentation, Membership Esteem x Affordable Loss, …) is rarely consistent enough to avoid spoiling structural model fit. Thus, in this experimentation, has been firstly tried to assess the regression analysis implying all the interaction terms. But when the results obtained are not consistent because of the interaction terms, a reduction of the number of second-order interaction indicators has been pursued (e.g. Collective

Identity, a second-order LV with four first-order LV and 16 indicators has been respecified as a first-order LV by replacing the latent variables scores by the average of its indicators, and doing the same with Effectuation but on the second-order term).

In order to explore how the model responds to the theory, an easy regression model has been analysed with the second-order LV. Environmental hostility has been predicted in several steps using the score for the second-order constructs. Firstly, EH, has been predicted only by Effectuation. The result has provided a non-significant positive relationship between Effectuation and EH (P-value: 0.128). Then, Collective Identity LV has been added in order to explore how can help to predict as a main effect. The result shows no significance of any of both constructs in EH, CI coefficient is negative but its P-value is 0.332. Effectuation coefficient decreased a little bit. Lastly, the interaction term was added. The result from this addition, can be considered. The Effectuation term gets a P-value of 0.101 which could be considered as significant at 10% level. The Coefficient belonging to Effectuation is 0.388 which shows a positive relationship between Environmental Hostility and Effectuation, which assess H1. Then, the selected control variables (e.g. Gender, Industry, Education…) have been added and only the interaction term became significant. All the VIF values are below 3, being 1.56 (Acc_Exp) the maximum VIF value. Coefficients obtained from the results are not standardized due to it is enough and easy to understand the results qualitatively and most of the variables are measured with the same scale.

According to the methodology explained, the same analysis has been carried out but using the first-order LV. In the first step of the regression, the four dimensions of the independent variable, Effectuation has been added (i.e. Experimentation, Affordable Loss…). Here Experimentation plays a role in EH with a significant positive coefficient. Subsequently, the main effects have been added (i.e. four dimensions of Effectuation and four dimensions of Collective Identity) to predict Environmental Hostility on more detailed way. Once obtained the results, none of the dimensions get a significant coefficient. Despite of it, Experimentation is the LV with a lower P-value (0.112), almost significant. The proportion of variation on the dependent variable accounted for by the independent variables in the model (R^2) correspond to 15.58%. Furthermore, the

significance test F-test, indicates the null hypothesis that the population R-square is equal to zero (P-value: 0.490). Regarding to the Variance Inflation Factors (VIF), two of them (e.g. Importance to Identity and Public Collective Self Esteem) are above the threshold of 3.30 established by (Diamantopoulos & Siguaw, 2006) but below the threshold of 5 and 10 suggested by (Ringle, et al., 2015) and (Hair, et al., 2010).

After this, the interaction terms have been added. The interaction terms, in this case, correspond to the product of the four sub dimensions of both second order constructs, what provide 16 interaction terms. Running the regression with the 8 main effects and the 16 interaction terms, only one main effect and two interaction effects are significant (e.g. Importance to Identity, Precommitments x Public Collective Self Esteem and Precommitments x Importance to Identity). This second step explained 52.56%, of outcome variance (R^2) but VIF are highly above the threshold (>100) what indicates the standard errors are inflated and are contributing to a problem with significance.

As previously explained, adding a considerable number of interaction terms can mess the fit of the model. Thus, a respecification of Effectuation construct is carried out, combining the four dimensions of the construct in only one term in order to reduce the interaction terms. Nevertheless, (Allison, 2012) says that the high VIFs are caused by the inclusion of powers or products of other variables and it is a situation in which a high VIF is not a problem and can be safely ignored.

Multicollinearity is a common problem when estimating linear or generalized linear models, including logistic regression and Cox regression. It occurs when there are high correlations among predictor variables, leading to unreliable and unstable estimates of regression coefficients. Having specified the interaction terms as the product of the main effects, it is highly probable that the variables are correlated. Despite of it, the p-value is not affected by the multicollinearity. In this context, the correlation values can be decreased by "centering" the variables. This "centering" implies subtracting the mean value of the predictor variables before creating the interaction terms. This process will reduce the correlations but the p-value and R^2will remain the same.

According to this, and with the aim to check if the VIF of the interaction terms are reduced, the 8 first order latent variables of both predictor constructs (e.g. Effectuation and Collective Identity), obtained by the mean value of the indicators are centered by subtracting the mean value.

Once the variables are centered, the first two steps have been repeated. As it is already said, no difference in terms of p-value and R^2 are obtained. Coefficients significances in the first step remain the same despite of the constant value which becomes significant in the centered analysis.

In the second step, where the interaction terms have been added, coefficients for the main effects are different compared with the obtained when they were not centered, but interaction terms coefficients are the same value comparing centered and no centered variables. Taking this into account, after this second step, the two interaction terms that were significant, still are at 10% (Precommitments x Public Collective Self Esteem and Precommitments x Importance to Identity) and in this case, the constant term too (p-value < 0.001).

The difference between this two methods are the VIF values. Whereas the mean VIF was 522.70 when the variables were not centered, having the items centered, this mean VIF decrease up to 8.80. The two interaction terms whose p-value makes them significant, have a VIF value of 9.70 and 9.92. They are still high, but considering the multicollinearity present in the interaction terms and considering the threshold of 10 established by (Hair, et al., 2010), these two interactions effects can be accepted.

Next, all non-discarded control variables have been added to see how the $R^2$of the model is increased and how the significance varies. Nevertheless, the control variables must be explored by separated groups related to different aspects. Once all the control variables are added, R^2 increased up to 93.33% of variance explained but P-value: 0.471 and R-adjust 0.1835. Here, only one control variable is significant (e.g. Pos_Clev: Operative position in company as TMTmember; P-value: 0.088).

In order to explore how the significance of the variables is changing, some modifications have been applied by deleting the control variables with less significance (i.e. higher P-value). If

Me_Fam is deleted, gender becomes significant (P-value: 0.065). If Total_Mon is deleted, Pos_mon becomes significant (P-value: 0.046) and the interaction effects (Affordable Loss x Membership Esteem and Flexibility x Importance to ID) too. After deleting four control variables (e.g. Me_Fam, Edu_Entre, Total_Mon and ME_Vorb) the total P-value decreased up to 0.089 and R^2 changed to 92.70% of variance explained and R-adjust 0.5527. Significant variables were one main effect, four interaction effects and eight control variables.

These modifications have been done until trying to get the maximum number of elements significant. This result has been obtained after deleting 10 control variables (See Table 14). After these subtractions, a significant P-value for the F-test has been reached (0.0087) and R-adjusted of 0.6314. At this point, two main effects and seven interaction terms are significant. Furthermore, 11 out of the 12 remaining control variables are significant and the one that not, has a P-value of 0.106 (Edu_Incub_In). Furthermore, VIF terms for the control variables are below the threshold of 10, except in one case (e.g. Pos_Clev). On the other hand, for the interaction terms, all the significant coefficients has a VIF above the threshold.

After this approach, a separate multigroup analysis has been carried out. First of it, the gender analysis has been studied. Gender variable has been added to main effects and interaction terms. A positive coefficient has been obtained for gender when male as a base, but no significance (P-value: 0.122). If female is changed as a base, this coefficient changes to (-0.878).

Afterwards, entrepreneurship educational aspects have been studied. As it is said before, the access to incubators or to specific education on entrepreneurship can facilitate the application of effectual processes. Results show no significant coefficients and a contradiction between access to incubators at university and out university appears, both coefficients have contrary effect when they are studied alone.

Another exploration has been done separately for those people who had previous entrepreneurial experience (e.g. Entrepreneurial role models in direct contact and Own experience in entrepreneurship). When adding control variables relate to this access to entrepreneurial

experience (e.g. Acc_Role and Acc_Exp) only Acc_Exp (i.e. Own experience in entrepreneurship) is significant affecting negatively to EH, whereas, having direct contact with entrepreneurial role models seems to affect positively. However, when combining and studying together educational and experience aspects of entrepreneurship, having access to entrepreneurial experience affects negatively and access to incubators positively and the interaction effect of Experimentation with Importance to ID is not significant. Nevertheless, none of the items in this type of analysis are significant.

Regarding to industry effect, when industry is the only control effect, only the interaction effect involving Precommitments and Importance to Identity is significant at 10% level (0.863 P-value: 0.075). However, when the control variable is expanded and studied more specifically, in function of the industry type, taking the automotive sector as a base, four more interaction effects (e.g. Precommitments x Public Collective Self-Esteem, Flexibility x Importance to ID…) get significant as the type of industry, except in the case of media sector companies.

When all the previous control variables studied separately, are studied together, gender and people who own experience in entrepreneurship (i.e. Acc_Role) become significant. These two control variables, get significance and together with the other controls make that Precommitments x Importance to ID, Precommitments x Public Collective Self-Esteem and Private Collective Self-Esteem get a significant value in the regression. Private Collective Self-Esteem and Precommitments x Importance to ID have a positive effect on Environmental Hostility, whereas Precommitments x Public Collective Self-Esteem has a negative effect.

As previously said, moderations underlies the same concept as interaction. In this case, Effectuation is the independent variable, considered the first predictor, whose effect as predictor has an effect on a response of EH for different values of the second predictor, CI, called moderator.

As CI is just the moderator, the interest remain on how is the effect of Effectuation on EH and how this effect changes for the different values of CI. The effect of CI on EH is not the main interest (Grace-Martin, 2014).

In order to have a better interpretation of the interaction effects, several graphs have been created to see the effect of Effectuation at different values of CI. As Effectuation is a continuous variable, the best way to measure the effect of CI is through a slope. The slope of the regression line varies depending on the value of the moderator.

In this case, as the moderator variable is a continuous, it contains many values. The best method, and the most common too, to choose the values for plotting the moderator effect is the one based on the mean. This method, suggested by (Cohen & Cohen , 1983), indicates to take three values of the moderator variable: the mean, the value one standard deviation above, and the value one standard deviation below the mean. If the variables are already centered, the mean value corresponds to 0.

The moderator effect can be analysed by comparing the R^2 values for the models (Cohen & Cohen , 1983). If the partial F-value associated with the change in R^2 is significant, then the moderator effect is significant (Zahra & Garvis, 2000).

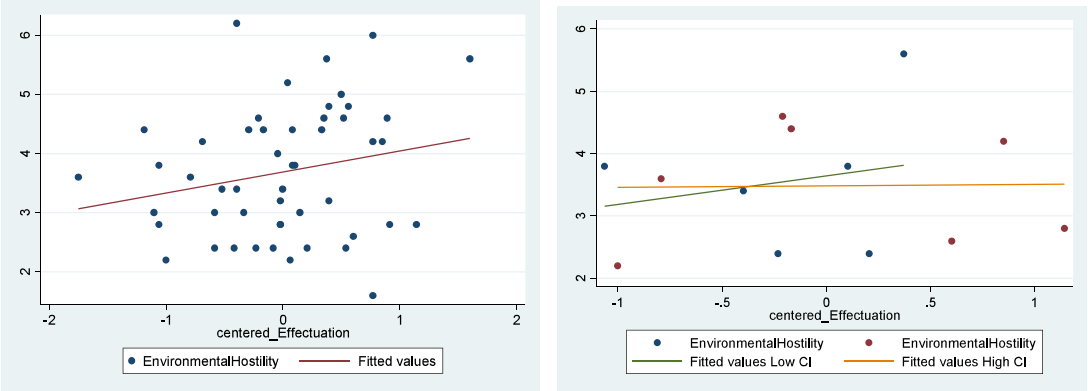

Figure 7: Regression results for moderated EH (Divided vs non divided per level of CI).

4 Discussion and interpretation

This study examined the impact of Collective Identity on the relationship between Effectuation and Environmental Hostility, and explored the moderating effect of Collective Identity in its relationship. The three constructs involved were analysed through Exploratory and Confirmatory analyses. Firstly, an EFA separately for each construct was carried out to assess the reliability of the scales used in the survey and the established constructs. These analyses were made through different steps. As the first results did not fit the expected results from literature (Luhtanen and Crocker, 1992; Chandler *et. al*, 2011; Torkkeli *et al.*, 2011), the factor extraction using STATA and SPSS was forced to extract the theorised number of factors. The extraction method of Principal Component and Promax rotation succeeded in Effectuation and EH construct, but in CI. Despite of it, all of them had satisfactory results of scale validity (e.g. KMO and Cronbach's alpha), good factor loadings and good variance explanation (Table 6). Attending the results of the EFA, two variables were deleted in the Effectuation construct (Eff_Flex3 and Eff_Pre3x). The two remaining constructs remained as suggested by literature (Luhtanen & Crocker, 1992; Torkkeli *et al.*, 2011).

Considering the results of the EFA, subsequently was performed the CFA. Here, the constructs were studied separately too trying to assess the literature in search for a good model fit. Every construct was a different type, two were second order constructs (Effectuation and CI) and EH was only a first order construct. For the hierarchical constructs, Effectuation is considered as type II, reflexive in the first term and formative in the second order. On the other hand, CI is type I, reflexive – reflexive. This assumption suggests the possibility to analyse them using different methods, as the second stage or repeated indicator approach. Considering the limitations of the data size and the program use to it (AMOS), successful results were not obtained. The model fit for Effectuation is properly good when it is modelled as a first order construct (χ^2/df = 1.261 ; P-value = 0.064), but when it is modelled as second order, the model fit get worse and discriminant validity too (AVE = 0.159; CR = 0.386). Environmental Hostility construct validity values are below the threshold too (AVE = 0.246; CR = 0.586). Nevertheless, CI analysis has

produced a huge number of errors. The main problem has been the non positive definite covariance matrix, whose main reason is due to small data size. This error has been tried to correct by several modifications. The construct has been remodelled (e.g. constraining paths, variances…). Discriminant validity test was carried out and surprisingly CR value was above the threshold and AVE slightly below it (AVE = 0.464; CR = 0.775). However, the model fit is not adequate.

Other researchers have also tried to assess the CI scale and they did not success (Rossouw, 2010). According to his findings, CSE Scale is a reliable instrument (in his case for South African use), but the CFA determined that it is not factorially valid. The fit indexes indicate that the theorized four-factor model is not a good fit to the data. It was found a high correlation between Membership Self Esteem and Private Collective Self Esteem (0.80) what suggests to measure the same latent variable. Furthermore, results from CFA to model fit were far below the threshold what did not provide a reasonable fit.

In this study, the highest correlation has been found between Importance to Identity and Private / Public Collective Self Esteem (0.746 and 0.853 respectively). Nevertheless, the highest correlation in Crocker's (1992) study, was found between the Membership SE and Private Collective SE.

Unfortunately, a good model fit for CI construct has not been possible to assess. The small size of the dataset has not helped to get better results. However, Luhtanen and Crocker (1992) tested four models for the CI scale and none of their models showed a good fit, especially with regard to $\chi 2$ statistic and the $\chi 2$ /df ratio.

Furthermore, the CSE scale is a relatively short survey, with only 16 items for four underlying constructs. Psychologists get an understanding of a person's self-esteem by asking the individual to reflect upon itself (Tafarodi & Ho, 2009) , so as commented before, the measure of the Self Esteem is something subjective, rely on memory and their experiences, then the probability to introduce CMB is very high. Here, the researcher was not in attendance. Consequently,

respondents would not have been able to ask for clarification of the questions from the researcher in which they were not sure about what to answer.

Here, it has been said that Effectuation is a proposed new theory of entrepreneurship (Saravasthy, 2001) which is an improvement of causation method in situations of uncertainty. Some authors suggest that higher levels of innovative, risk-taking behaviour are associated with uncertain environments (Pierce & Delbecq, 1977). This uncertainty perceived by a firm can derive from unfavourable external forces which are defined as Environmental Hostility. Therefore, in environments where the hostilities are more evident, Effectual performance can lead to better results. So a positive relationship between Effectuation and EH should exist (H1) and that has been observed in the regression analysis where Effectuation has a positive effect on EH, and gets significant when CI, is introduced as a second order variable as moderator (0.388; P-value < 0.10).

Another study assessed a positive relationship between EH and Effectuation (Sibonelo Mthanti, 2012), where EH was the Independent Variable and Effectuation the dependent. It suggested that Environmental Hostility accounted for 5% of the variation in effectuation. There, it was also tested EH as a moderator variable in Effectuation to innovative performance. Furthermore, it was also found a positive correlation between EH and Flexibility. These findings follow the lines Brettel et al. (2012) have also suggested that successful innovative entrepreneurs maintain Flexibility, utilize Experimentation and the Affordable loss principle and have a preference for partnerships and leverage contingencies. According to this, it is established that Experimentation should be positively correlated to EH (H2). Findings suggest a positive significant relationship between Experimentation and Effectuation (0.219; P-value < 0.10) but it becomes insignificant when CI is added as moderator and turns to negative when control variables are added.

It is said that entrepreneurs who perceive a hostile environment are more disposed to establish partnerships with third parties in the existing market in order to decrease the perceived hostility. As it is said by Saravasthy (2001) establishing pre-commitments and alliances with customers, suppliers and other strategic partners helps to reduce the uncertainty associated with the venture. Diversifying risk among multiple stakeholders allows the effectuator to constrain the potential

loss, thus making it more affordable. Therefore, as higher is EH more relationships should be established, then the H3 is not assessed in the findings due to a negative relationship between Pre-commitments and EH.

Here is important to consider that other authors had reliability problems on the precommitment scale adapted from Chandler et al. (2011), (Sibonelo Mthanti, 2012). As a result of it, they suggest that maybe effectual entrepreneurs do not use Precommitments to maximise performance, but rather to manage risk by spreading it out amongst different partners.

When control variables are added, the interaction terms of Precommitments with two dimensions of CI become significant. These interaction terms have an opposed effect. On one hand, the interaction between Precommitments and Public Collective Self Esteem has a negative effect on EH. On the other hand, Precommitments and Importance to Identity effect has a positive relation between EH and Effectuation. It is important to notice that Importance to Identity becomes significant when various control variables are added, but its effect is negative related to EH, as the contrary when it interacts with Precommitments. Importance to ID measures the importance of a person's social group memberships to his/her self concept, so these results suggest when somebody has a high good perception of his group membership, the EH is not as high as if its perception was lower (H4).

Regarding to the control variables, gender is positively related to EH and the effect is higher for the women than the men (H5). Despite of it, the slope for women has less inclination than men, so the difference between them becomes smaller for a higher values of Effectuation (Figure 8).

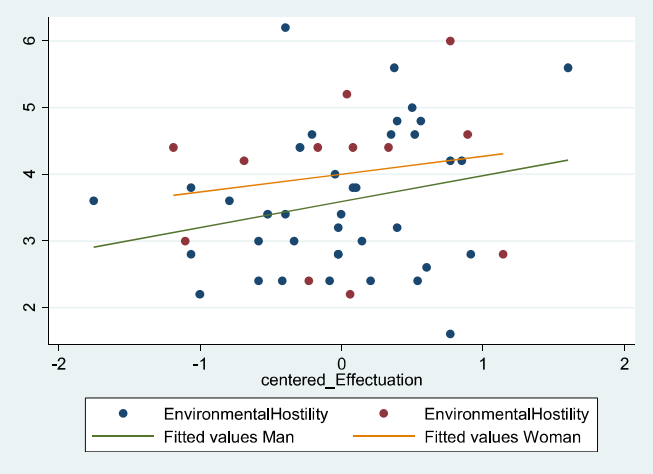

Figure 8: Regression model for men and women.

Innovative firms utilize new ideas and products, as well as new technological processes, to develop new products, processes and/or markets (Covin & Slevin , 1989). In high-technology industries, such as biotechnology, innovation is primarily dependent on inter-organisational collaboration (Mithanti & Urban , 2014). In addition, high-technology ventures are normally regarded as more entrepreneurial; especially an emerging market context because the environment is more risky and uncertain and competitive advantages come from innovative and proactive orientation (Peng, 2001). According to this assumption, industries highly related to technology should perceive more EH. Results show that industry is not a significant variable in the relationship, and when it is individually explored it has a negative relationship. Despite of its negative relations, considering the Automotive sector as a base, the Real Estate and Financial services are the two significant industries with higher negative relationship. They can also be considered as the less exposed to technology (H6). Furthermore, media is the only sector with no significant value when it is separately studied (Table 15).

Finally, when entrepreneurship is involved, personality and Self Esteem has been demonstrated to play an important role. Furthermore, education is an important factor in the way this personality is performed. Then, the education degree, the relationships previously established with other entrepreneurial people will affect the way one acts in his entrepreneurial phase. Therefore, those

subjects with access to entrepreneurial education, access to incubators or those who had a direct contact with entrepreneurs, are more disposed to apply effectual methods. Results show that those who had previous access to incubators show a positive relationship between EH and Effectuation, but not significant (Table 13). However, having had contact with previous entrepreneurs or previous experience on entrepreneurship reveals a negative relationship, significant for those with experience (-1.316; P-value < 0.05). Furthermore, this relationship is also negative for the educational aspect.

As seen before, the regression analyses do not get a proper model fit, (i.e. significant value for the F-test statistic) until the control variables are added. Residuals normality has been assessed using the Jarque – Bera test and the P-value corresponds 0.759 when tried with the second order variables regression (CI x Effectuation). This result suggests not to reject the null hypothesis of normality. Therefore, residuals are considered normal and data is not affected by non-normality. The histogram of residuals fit the normal distribution.

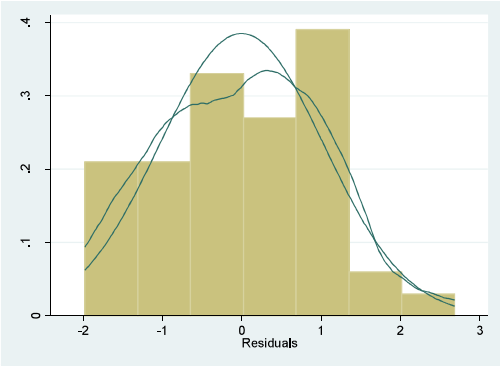

Figure 9: Histogram for residuals normality using Collective Identity and Effectuation construct to predict EH.

5 Conclusion

In summary, Effectuation has been the independent variable of this study. It has been adopted Chandler et al.'s (2011) characterization of effectuation as a formative multi-dimensional construct with four associated sub-constructs: Experimentation, Affordable loss, Flexibility and Precommitments.

On the other hand, Environmental Hostility has been considered to be the construct treated as dependent variable. This construct is reflected by five items which try to describe the typical unfavourable climate that firms competing in new markets suffer. The environment has long been considered as one of the critical contingencies in strategic management. In these environments, unpredictable changes are frequent and the use of the non-predictive strategy, as suggests the Effectuation, can be beneficial to entrepreneurial firms (Wiltbank, 2006). Results obtained in the regression analyses show a positive relationship between Effectuation and Environmental Hostility, what goes in consonance what is already researched, but this relationship is not always significant.

Moreover, how the entrepreneur managers, feel or define themselves plays a decisive role. Their personality and how they and other people see them, is one of the main potential internal factors affecting to the Effectuation. This aspect is considered contained in the Collective Identity construct and in this thesis has been studied how it can impact in the relationship between Effectuation and Environmental Hostility.

Results provide a light evidence that the effects of Effectual performance in hostile environments might be respectively moderated by their Collective Identity. The interaction between CI and Effectuation on EH prediction is negatively significant. These findings suggest that the effects of the strategy applied in these environments can depend on one's person self-esteem and not any pre-established aspect valid for everybody.

Despite of it, not all the hypotheses were supported. However, these results should be interpreted with caution. Scales could not be properly assessed and reliability and validity were not confirmed in this context. Therefore, some scales were taken as suggested in previous literature and not modified. Results are not very consistent and further analyses should be carried out. Having taken the scales as in the literature can induce to not adequate results because the validity of this scale in this context is not assessed. That situation has been also suffered by other researchers who found that in CI construct, two of the latent variables were highly correlated and should change it could not be fully reliable in its context (Rossouw, 2010).

The current study has been performed with the responses obtained from 50 participants of a survey delivered to people in managerial positions in German SMEs involving different sectors. Data size has been a disadvantage in order to proceed with the analyses. Therefore, in further research a major number of respondents would help to get more data and increase the possibility to validate the established constructs and perform a better analysis.

6 Appendix

Considerations:

SME

The term SME is used to characterize companies termed "small" or "medium-sized" on different scales, such as the number of employees and/or the annual turnover. These category thresholds vary between countries, as do the sizes of the economic sectors. The Organisation for Economic Co-operation and Development (OECD) terms them "non-subsidiary, independent firms which employ fewer than a given number of employees" (OECD 2008). The European Commission, on the other hand, has created a unified definition in stating that a medium-sized firm is one that lists less than 250 employees and whose yearly turnover or yearly balance-sheet total is less than 50 million and less than 43 million euros, respectively (European Commission 2003). On the other hand, in Canada and the USA, for example, the threshold between a "large" and a "medium-sized" firm is considered to be 500 employees (OECD 2008). In accordance with these guidelines, in this study we designated a firm as an SME if it had fewer than 500 employees and if its reported turnover was less than 50 million euros at the time of the data collection.

Table 1. Measurement Scales

Construct	**Dimension**	Item Code	Measurement Item
Effectuation (Formative)	**Experimentation** (Reflective)	Eff_Ex1	We experimented with different products and/or business models.
		Eff_Ex2r	The product/service that we now provide is essentially the same as originally conceptualized.
		Eff_Ex3	The product/service that we now provide is substantially different than we first imagined.
a.		Eff_Ex4	We tried a number of different approaches until we found a business model that worked.
b.	**Affordable Loss** (Reflective)	Eff_Aff1	We were careful not to commit more resources than we could afford to lose.
		Eff_Aff2	We were careful not to risk more money than we were willing to lose with our initial idea.
		Eff_Aff3	We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out.
		Eff_Aff4x	Try to limit the potential loss of initiatives to an acceptable degree.
	Flexibility (Reflective)	Eff_Flex1	We allowed the business to evolve as opportunities emerged.
		Eff_Flex2	We adapted what we were doing to the resources we had.
		Eff_Flex3	We were flexible and took advantage of opportunities as they arose.
		Eff_Flex4	We avoided courses of action that restricted our flexibility and adaptability.
	Precommitments (Reflective)	Eff_Pre1	We used a substantial number of agreementswith customers, suppliers and other organizations and people to reduce the amount of uncertainty.

Table 1. Measurement Scales - Continued

		Eff_Pre2	We used pre-commitments from customers and suppliers as often as possible.
		Eff_Pre3x	As the managers of this company, we consider it important that both we ourselves and our employees approach potential partners very early on in order to jointly co-create the future.
		Eff_Pre4x	As the managers of this company, we consider it important that both we ourselves and our employees perceive new actors on the market as potential partners.
Environmental Hostility (Reflective)	**Regulatory Hostility**	Ehost_1	Access to capital is difficult.
	Technological Hostility	Ehost_2	Products become obsolete quickly.
	Competitor Hostility	Ehost_3	Bankruptcy among companies in the industry is high.
	Customer Hostility	Ehost_4	Demand for industry products is declining.
	Added von Naman / Slevin 93	Ehost_5x	Our company must often change its marketing practices to keep up with the competitors.
Collective Identity (Reflective)	**Membership Esteem (Reflective)**	CI.1_ME1	I am a worthy member of the social groups I belong to.
		CI.5_ME2r	I feel I don't have much to offer to the social groups I belong to. ®
		CI.9_ME3	I am a cooperative participant in the social groups I belong to.
		CI.13_ME4r	I often feel I'm a useless member of my social groups. ®

Table 1. Measurement Scales - Continued

Private Collective Self-Esteem	CI.2_Pr1r	I often regret that I belong to some of the social groups I do. ®
	CI.6_Pr2	In general, I'm glad to be a member of the social groups I belong to.
	CI.10_Pr3r	Overall, I often feel that the social group of which I am a member are not worthwhile. ®
	CI.14_Pr4	I feel good about the social groups I belong to.
Public Collective Self-Esteem	CI.3_Pu1	Overall, my social groups are considered good by others.
	CI.7_Pu2r	Most people consider my social groups, on the average, to be more ineffective than other social groups. ®
		In general, others respect the social groups that I am a member of.
	CI.11_Pu3	In general, others think that the social groups I am a member of are unworthy. ®
	CI.15_Pu4r	In general, others think that the social groups I am a member of are unworthy. ®
Importance to Identity	CI.4_II1r	Overall, my group memberships have very little to do with how I feel about myself. ®
	CI.8_II2	The social groups I belong to are an important reflection of who I am.
	CI.12_II3	The social groups I belong to are unimportant to my sense of what kind of a person I am. ®
	CI.16_II4	In general, belonging to social groups is an important part of my self-image.

Table 2. Data Screening

Effectuation	Mean	SD	Min	Max
1. **Experimentation** (Reflective)	3.535	1.381	1	6
2. **Affordable Loss** (Reflective)	4.535	1.559	2	7
3. **Flexibility** (Reflective)	5.733	0.904	3.333	7
4. **Precommitments** (Reflective)	4.620	1.269	2	7
Collective Identity				
1. **Membership Esteem**	5.31	1.046	2.75	7
2. **Private Collective Self-Esteem**	5.255	0.788	3.75	7
3. **Public Collective Self-Esteem**	5.37	0.833	3.5	7
4. **Importance to Identity**	5.245	0.861	3	7
Environmental Hostilty				
1. **Environmental Hostility**	3.688	1.095	1.6	6.2

Table 3. Data Screening – Item detailed

	Mean	Mean Stand. Error	SD	Skewness	Kurtosis	Min	Max
Effectuation							
Eff_Ex1	4.16	0.279	1.973	-0,066	-1.241	1	7
Eff_Ex2r	2.66	0.221	1.560	0,799	-0.124	1	7
Eff_Ex3	3.42	0.254	1.797	0,366	-1.046	1	7
Eff_Ex4	3.90	0.286	2.023	-0,043	-1.487	1	7
Eff_Aff1	4.58	0.268	1.896	-0,353	-1.247	1	7
Eff_Aff2	4.34	0.264	1,869	-0,031	-1.450	1	7
Eff_Aff3	4.34	0.284	2.006	-0,253	-1.393	1	7
Eff_Aff4x	4.88	0.240	1.698	-0,378	-0.884	1	7
Eff_Flex1	5.92	0.142	1.007	-0,584	-0.699	4	7
Eff_Flex2	5.50	0.190	1.344	-0,736	-0.130	2	7
Eff_Flex3	5.78	0.174	1.234	-0,988	0.058	3	7
Eff_Flex4	5.04	0.176	1.245	-0,277	-0.471	2	7
Eff_Pre1	4.24	0.242	1.709	-0,007	-1.143	1	7
Eff_Pre2	3.76	0.266	1.880	0,209	-1.133	1	7
Eff_Pre3x	5.86	0.181	1.278	-1,133	0.728	2	7
Eff_Pre4x	4.92	0.266	1.883	-0,606	-0.838	1	7
Collective Identity							
CI.1_ME1	5.72	0.137	0.970	-0.238	-0.882	4	7
CI.5_ME2r	5.56	0.186	1.312	-0.984	0.658	2	7
CI.9_ME3	5.70	0.157	1.111	-0.669	-0.226	3	7
CI.13_ME4r	4.26	0.237	1.676	-0.186	-0.959	1	7
CI.2_Pr1r	5.64	0.136	0.964	-0.202	-0.854	4	7
CI.6_Pr2	5.66	0.168	1.189	-1.044	0.948	2	7
CI.10_Pr3r	5.12	0.171	1.206	-0.457	-0.316	2	7
CI.14_Pr4	4.60	0.206	1,457	-0.330	-0.212	1	7
CI.3_Pu1	5.62	0.134	0.945	-0.210	-0.785	4	7
CI.7_Pu2r	5.72	0.140	0.991	-0,580	-0.045	3	7
CI.11_Pu3	5.70	0.152	1.074	-1.010	1.518	2	7
CI.15_Pu4r	4.44	0.208	1.473	-0.376	0.366	1	7

CI.4_II1r	5.54	0.177	1.249	-0.881	0.291	2	7

Table 3. Data screening – Continued

CI.8_II2	5.60	0.159	1.125	-0.842	0.654	2	7
CI.12_II3	5.30	0.167	1.182	-0.232	-0.393	2	7
CI.16_II4	4.54	0.186	1.313	-0.260	0.310	1	7
Environmental Hostility							
Ehost_1	4.58	0.236	1.667	-0.228	-0.864	1	7
Ehost_2	3.28	0.248	1.750	0.384	-0.865	1	7
Ehost_3	3.92	0.249	1.759	0.244	-1.146	1	7
Ehost_4	2.08	0.180	1.275	1.136	0.623	1	6
Ehost_5x	4.58	0.264	1.864	-0.535	-0.921	1	7
		Skewness Stand. Error = 0.337			Kurtosis Stand. Error = 0.662		

Table 4. EFA results

	α	Item Loading	Uniqueness
Effectual Performance (formative, seven-point Likert scale: 1 = "not all," and 7 = "very much")	0.714		
1. **Experimentation** (Reflective)	0.739		
a. We experimented with different products and/or business models.		0.726	0.347
b. The product/service that we now provide is essentially the same as originally conceptualized.		0.760	0.385
c. The product/service that we now provide is substantially different than we first imagined.		0.614	0.441
d. We tried a number of different approaches until we found a business model that worked.		0.860	0.237
2. **Affordable Loss** (Reflective)	0.852		
e. We were careful not to commit more resources than we could afford to lose.		0.913	0.206
f. We were careful not to risk more money than we were willing to lose with our initial idea.		0.864	0.240
g. We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out.		0.828	0.277
h. Try to limit the potential loss of initiatives to an acceptable degree.		0.700	0.445
3. **Flexibility** (Reflective)	0.617		
i. We allowed the business to evolve as opportunities emerged.		0.601	0.509
j. We adapted what we were doing to the resources we had.		0.742	0.390

Table 4. EFA results - Continued

	α	Item Loading	Uniqueness
k. We were flexible and took advantage of opportunities as they arose.		0.838	0.303
l. We avoided courses of action that restricted our flexibility and adaptability.			
4. **Precommitments** (Reflective)	0.666		
m. We used a substantial number of agreements with customers, suppliers and…		0.858	0.196
n. We used pre-commitments from customers and suppliers as often as possible.		0.800	0.340
o. Approach potential partners very early on in order to jointly co-create the future.		0.571	0.509
p. Perceive new actors on the market as potential partners.			
Environmental Hostility (reflective, seven-point Likert scale: 1 = "not all," and 7 = "very much")	0.665		
1. **Regulatory Hostility** (Reflective)			
a. Access to capital is difficult.		0.510	0.740
2. **Technological Hostility** (Reflective)			
b. Products become obsolete quickly.		0.7135	0.491
3. **Competitor Hostility**			
c. Bankruptcy among companies in the industry is high.		0.678	0.540
4. **Customer Hostility**			
d. Demand for industry products is declining.		0.644	0.585
5. **Added von Naman / Slevin 93**			
e. Our company must often change its marketing practices to keep up with the competitors.		0.721	0.481

Table 5. Collective Identity EFA results

Collective Identity (reflective, seven-point Likert scale: 1 = "not all," and 7 = "very much")	Factor 1	Factor 2	Factor 3	Factor 4	Uniqueness
1. **Membership Esteem** (Reflective)					
a. I am a worthy member of the social groups I belong to.	0.749				0.245
b. I feel I don't have much to offer to the social groups I belong to. ®	0.869				0.165
c. I am a cooperative participant in the social groups I belong to.	0.680				0.197
d. I often feel I'm a useless member of my social groups. ®	0.624			0.507	0.348
2. **Private Collective Self-Esteem** (Reflective)					
e. I often regret that I belong to some of the social groups I do. ®		0.576			0.517
f. In general, I'm glad to be a member of the social groups I belong to.		0.660			0.374
g. Overall, I often feel that the social group of which I am a member are not worthwhile. ®			0.612		0.356
h. I feel good about the social groups I belong to.				0.771	0.283
3. **Public Collective Self-Esteem** (Reflective)					
i. Overall, my social groups are considered good by others.		0.797			0.281
j. Most people consider my social groups, on the average, to be more ineffective than other social groups. ®		0.769			0.231
k. In general, others respect the social groups that I am a member of.			0.687		0.303

l.	In general, others think that the social groups I am a member of are unworthy. ®			0.706	0.382
4. **Importance to Identity** (Reflective)					
m.	Overall, my group memberships have very little to do with how I feel about myself. ®	0.8724			0.245
n.	The social groups I belong to are an important reflection of who I am.	0.840			0.234
o.	The social groups I belong to are unimportant to my sense of what kind of a person I am. ®		0.869		0.216
p.	In general, belonging to social groups is an important part of my self-image.			0.822	0.250

Table 6. Validation and correlation matrix (EFA)

Effectuation	1	2	3	4
1. **Experimentation** (Reflective)	1			
2. **Affordable Loss** (Reflective)	-0.178	1		
3. **Flexibility** (Reflective)	0.211	0.047	1	
4. **Precommitments** (Reflective)	0.020	0.065	0.110	1
Chi –Square	246.356			
P-value	< 0.001			
KMO	0.601			

Environmental Hostility	1
1. **Environmental Hostility**	1
Chi –Square	34.068
P-value	< 0.001
KMO	0.704

Collective Identity	1	2	3	4
1. **Membership Esteem**	1			
2. **Private Collective Self-Esteem**	0.342	1		
3. **Public Collective Self-Esteem**	0.256	0.371	1	
4. **Importance to Identity**	0.312	0.201	0.365	1
Chi –Square	468.806			
P-value	<0.001			
KMO	0.777			

Table 7. Measurement Scales CFA

	VIF	CR	AVE	Item Loading
Effectual Performance (formative, seven-point Likert scale: 1 = "not all," and 7 = "very much")		0.386	0.159	
1. **Experimentation** (Reflective)	1.15	0.755	0.448	
a. We experimented with different products and/or business models.				0.53
b. The product/service that we now provide is essentially the same as originally conceptualized.				0.57
c. The product/service that we now provide is substantially different than we first imagined.				0.60
d. We tried a number of different approaches until we found a business model that worked.				0.91
2. **Affordable Loss** (Reflective)	1.32	0.604	0.857	
e. We were careful not to commit more resources than we could afford to lose.				0.89
f. We were careful not to risk more money than we were willing to lose with our initial idea.				0.82
g. We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out.				0.76
h. Try to limit the potential loss of initiatives to an acceptable degree.				0.61
3. **Flexibility** (Reflective)	1.14	0.340	0.605	
i. We allowed the business to evolve as opportunities emerged.				0.66
j. We adapted what we were doing to the resources we had.				0.51
k. We were flexible and took advantage of opportunities as they arose.				0.57

l. We avoided courses of action that restricted our flexibility and adaptability.				
4. **Precommitments** (Reflective)	1.10	0.340	0.599	
m. We used a substantial number of agreements with customers, suppliers and…				0.53
n. We used pre-commitments from customers and suppliers as often as possible.				0.47
o. Approach potential partners very early on in order to jointly co-create the future.				0.72
p. Perceive new actors on the market as potential partners.				
Environmental Hostility (reflective, seven-point Likert scale: 1 = "not all," and 7 = "very much")		0.246	0.586	
1. **Regulatory Hostility** (Reflective)				
f. Access to capital is difficult.				0.41
2. **Technological Hostility** (Reflective)				
g. Products become obsolete quickly.				0.47
3. **Competitor Hostility**				
h. Bankruptcy among companies in the industry is high.				0.43
4. **Customer Hostility**				
i. Demand for industry products is declining.				0.57
5. **Added von Naman / Slevin 93**				
j. Our company must often change its marketing practices to keep up with the competitors.				0.69

Table 8. Confirmatory Factor Analysis (CFA)

Effectuation First order (Loadings)	LV	Item 1	Item 2	Item 3	Item 4
1. **Experimentation**		0.53	0.57	0.60	0.91
2. **Affordable Loss**		0.89	0.82	0.76	0.61
3. **Flexibility**		0.66	0.51	0.57	
4. **Precommitments**		0.57	0.47	0.72	

χ^2	**df**	χ^2**/df**	**P-value**	CFI	GFI	RMSEA	SRMR
93.290	74	1.261	0.064	0.897	0.807	0.073	0.107

Effectuation Second order (Loadings)	LV	Item 1	Item 2	Item 3	Item 4
1. **Experimentation**	0.15	0.52	0.54	0.58	0.94
2. **Affordable Loss**	0.27	0.90	0.82	0.75	0.61
3. **Flexibility**	0.50	0.55	0.57	0.69	
4. **Precommitments**	0.54	0.30	0.23	0.26	

χ^2	**df**	χ^2**/df**	**P-value**	CFI	GFI	RMSEA	SRMR
93.620	75	1.248	0.072	0.900	0.807	0.071	0.121

Environmental Hostility	Item 1	Item 2	Item 3	Item 4	Item 5
1. **Environmental Hostility**	0.41	0.47	0.43	0.57	0.69

χ^2	**df**	χ^2**/df**	**P-value**	CFI	GFI	RMSEA	SRMR
0.757	4	0.189	0.944	1	0.994	0	0.022

Table 9. Confirmatory Factor Analysis (CFA) Collective Identity

Collective ID First order (Loadings)	LV	Item 1	Item 2	Item 3	Item 4
1. **Membership Esteem**		0.84	0.79	0.87	0.59
2. **Private Collective Self-Esteem**		0.60	0.72	0.35	0.37
3. **Public Collective Self-Esteem**		0.72	0.85	0.58	0.43
4. **Importance to Identity**		0.72	0.70	0.49	0.52

χ^2	**df**	χ^2**/df**	**P-value**	CFI	GFI	RMSEA	SRMR
209.473	98	2.137	<0.001	0.732	0.647	0.152	0.126

* Covariance matrix not positive definite

Collective ID Second order (Loadings)	LV	Item 1	Item 2	Item 3	Item 4
1. **Membership Esteem**	0.73	0.84	0.79	0.87	0.60
2. **Private Collective Self-Esteem**	0.64	0.76	0.72	0.30	0.69
3. **Public Collective Self-Esteem**	0.70	0.76	0.86	0.63	0.71
4. **Importance to Identity**	0.65	0.86	0.83	0.39	0.72

χ^2	**df**	χ^2**/df**	**P-value**	CFI	GFI	RMSEA	SRMR
310.545	103	3.015	<0.001	0.501	0.577	0.203	0.183

Table 10. Control variables

	Variable name	Description
Included		
	Found_Year	Founding year of company
	Total_Empl	Number fulltime employees
	Industry	Main industry of the company
	Gender	Gender
	Age	Age
	Edu	Highest education
	Edu_Entre	Classes on entrepreneurship
	Edu_Incub_in	Access to incubator programs AT university
	Edu_Incub_ex	Access to incubator programs OUTSIDE university
	Acc_Role	Entrepreneurial role models in direct contact
	Acc_Exp	Own experience in entrepreneurship
	Pos_Founder	(Co-)Founder (yes/ no)
	Pos_Clev	Operative position in company as TMT member
	Pos_Mon	Months on current position
	Total_Mon	Months in company
	ME_Koll	Identification with collegues
	ME_Freu	Identification with friends
	ME_Komm	Identification with fellow students
	ME_Fam	Identification with family
	ME_Vorb	Identification with role models
	SM_Acc	Access by which mean (i.e. Smartphone App, browse, PC…)
Discarded		
	Total_TO	Total turn over in 2017 in Million Euro
	Industry_Oth	Other industry * (String variable to specify the industry 12/50)
	Edu_MINT	Years of education regarding MINT classes
	Edu_Wiwi	Years of education regarding economic/ management classes
	Edu_Son	Years of education regarding other classes
	Pos_op_Son	Other operative position in company
	ME_Son	Identification with others
	SM_Site	Usage of which social channels (i.e. Facebook, Twitter, Ig…)

Table 11. Correlation terms

	Correlations							
Constructs	1	2	3	4	5	6	7	8
1.- Experimentation	-							
2.- Affordable Loss	-0.213	-						
3.- Flexibility	0.012	0.158	-					
4.- Precommitments	0.017	0.101	0.195	-				
5.- Membership Esteem	-0.204	-0.244*	-0.004	0.043	-			
6.- Private Collective Self Esteem	-0.094	-0.144	-0.005	0.126	0.548***	-		
7.- Public Collective Self Esteem	-0.075	-0.109	0.059	-0.011	0.552***	0.729***	-	
8.- Importance to Identity	-0.076	0.027	0.171	0.079	0.557***	0.746***	0.853***	-

Table 12. Findings of Regression Analysis

Dependent Variable: Environmental Hostility – Second order variables				
Independent Variables				
Main Effects	Step 1	Step 2	Step 3	Step 4
Effectuation	0.219	0.333	0.388*	0.275
Collective Identity		-0.201	-0.273	-0.275
Interaction Effects				
Effectuation x Collective Identity			-0.434	-0.593*
Controls				
Gender				0.399
Industry				0.035
Edu				0.288
Edu_Entre				0.063
Edu_Incub_in				0.424
Edu_Incub_ex				-0.285
Acc_Role				0.260
Acc_Exp				-0.329
Constant	2.050*	3.218**	3.666***	2.595*
R^2	0.048	0.067	0.106	0.241
$R^2 adjusted$	0.028	0.027	0.047	0.021
F	2.40	1.68	1.81	1.10

*p < 0.10 ;
**p < 0.05;
***p < 0.01;

Table 13. Findings of Regression Analysis

Dependent Variable: Environmental Hostility				
Independent Variables				
Main Effects	Step 1	Step 2	Step 3	Step 4
Experimentation	0.219*	0.198	0.249	-0.308
Affordable Loss	0.145	0.144	0.146	-0.245
Flexibility	-0.036	0.024	0.247	0.223
Precommitments	0.006	-0.011	-0.251	-0.074
Membership Esteem		-0.186	0.095	-0.319
Private Collective Self Esteem		0.441	0.496	1.517*
Public Collective Self Esteem		0.008	0.085	-0.187
Importance to Identity		-0.329	-0.633	-1.013
Interaction Effects				
Experimentation x Membership Esteem			0.017	0.268
Experimentation x Private Collective Self Esteem			-0.030	-1.181
Experimentation x Public Collective Self Esteem			-0.270	0.753
Experimentation x Importance to Identity			0.459	0.348
Affordable Loss x Membership Esteem			-0.282	-0.316
Affordable Loss x Private Collective Self Esteem			-0.049	-0.416
Affordable Loss x Public Collective Self Esteem			-0.253	-0.006
Affordable Loss x Importance to Identity			0.506	0.317
Flexibility x Membership Esteem			-0.049	0.179
Flexibility x Private Collective Self Esteem			-0.011	-0.820
Flexibility x Public Collective Self Esteem			-0.153	0.316
Flexibility x Importance to Identity			0.830	0.756
Precommitments x Membership Esteem			-0.074	-0.539
Precommitments x Private Collective Self Esteem			-0.184	-0.072
Precommitments x Public Collective Self Esteem			-0.811*	-1.211**
Precommitments x Importance to Identity			0.850*	1.815***

Table 13. Findings of Regression Analysis - Continued

Dependent Variable: Environmental Hostility				
Controls				
Gender				1.444**
Industry				-0.023
Edu				-0.299
Edu_Entre				-0.190
Edu_Incub_in				0.393
Edu_Incub_ex				0.256
Acc_Role				-0.113
Acc_Exp				-1.316**
Constant	3.688***	3.688***	3.380***	5.672**
R^2	0.0940	0.156	0.526	0.800
$R^2 adjusted$	0.013	-0.009	0.070	0.248
F	1.17	0.95	1.15	1.51*

Table 14. Findings of Regression Analysis

Dependent Variable: Environmental Hostility				
Independent Variables				
Main Effects	Step 1	Step 2	Step 3	Step 4
Experimentation	0.249	-0.043	-0.005	-0.018
Affordable Loss	0.146	0.023	0.840	0.035
Flexibility	0.247	0.446	0.534	0.420
Precommitments	-0.251	-0.192	-0.253	-0.139
Membership Esteem	0.095	-0.316	-0.454	-0.229
Private Collective Self Esteem	0.496	2.356	2.450**	1.631***
Public Collective Self Esteem	0.085	-0.746	-0.608	0.110
Importance to Identity	-0.633	-1.242	-1.229	-1.663***
Interaction Effects				
Experimentation x Membership Esteem	0.017	-0.170	-0.286	-0.086
Experimentation x Private Collective Self Esteem	-0.030	-1.820	-1.760**	-1.110**
Experimentation x Public Collective Self Esteem	-0.270	1.256	1.538*	0.771*
Experimentation x Importance to Identity	0.459	0.781	0.653	0.596*
Affordable Loss x Membership Esteem	-0.282	-0.558	-0.652*	-0.528
Affordable Loss x Private Collective Self Esteem	-0.049	0.204	0.258	0.052
Affordable Loss x Public Collective Self Esteem	-0.253	0.259	0.483	0.373
Affordable Loss x Importance to Identity	0.506	-0.237	-0.490	-0.256
Flexibility x Membership Esteem	-0.049	-0.518	-0.353	0.151
Flexibility x Private Collective Self Esteem	-0.011	-0.846	-0.564	-0.674
Flexibility x Public Collective Self Esteem	-0.153	-0.320	-0.937	-0.191
Flexibility x Importance to Identity	0.830	2.355	2.672**	1.670***
Precommitments x Membership Esteem	-0.074	-0.597	0.880	0.251
Precommitments x Private Collective Self Esteem	-0.184	-0.282	-0.360	-0.554
Precommitments x Public Collective Self Esteem	-0.811*	-0.942	-0.767	-1.020**
Precommitments x Importance to Identity	0.850*	0.807	0.475	1.259**

Table 14. Findings of Regression Analysis - Continued

Dependent Variable: Environmental Hostility				
Controls				
Found_Year		-0.486	-0.317	-0.240*
Total_Empl		0.004	0.004	
Industry		-0.084	-0.101	-0.097*
Gender		2.286	1.875**	1.504**
Age		0.026	0.037	
Edu		-0.464	-0.515*	-0.377**
Edu_Entre		-0.420		
Edu_Incub_in		0.642	0.733	0.547
Edu_Incub_ex		0.556	0.416	
Acc_Role		0.720	0.796	
Acc_Exp		-1.158	-0.961*	-1.093***
Pos_Founder		1.372	1.679**	1.472**
Pos_Clev		-1.243	-1.240***	-0.838***
Pos_Mon		-0.083	-0.053**	-0.038**
Total_Mon		0.029		
ME_Koll		0.506	0.508*	0.468**
ME_Freu		-0.472	-0.490*	-0.375*
ME_Komm		0.254	0.114	
ME_Fam		0.037		
ME_Vorb		-0.192		
SM_Acc		-0.328	-0.514	
Constant	3.380***	982.136	642.28*	489.100*
R^2	0.526	0.933	0.927	0.895
$R^2 adjusted$	0.070	0.184	0.553	0.631
F	1.15	1.24	2.48*	3.40***

Table 15. Findings of Regression Analysis

Dependent Variable: Environmental Hostility – (Analysing Industry)		
Independent Variables		
Main Effects	Step 1	Step 2
Experimentation	0.253	0.096
Affordable Loss	0.142	0.094
Flexibility	0.247	0.503
Precommitments	-0.248	-0.390
Membership Esteem	0.095	0.420
Private Collective Self Esteem	0.494	0.088
Public Collective Self Esteem	0.088	0.645
Importance to Identity	-0.635	-1.154
Interaction Effects		
Experimentation x Membership Esteem	0.019	0.070
Experimentation x Private Collective Self Esteem	-0.021	0.523
Experimentation x Public Collective Self Esteem	-0.282	-0.384
Experimentation x Importance to Identity	0.458	-0.047
Affordable Loss x Membership Esteem	-0.276	-0.597**
Affordable Loss x Private Collective Self Esteem	-0.051	0.545
Affordable Loss x Public Collective Self Esteem	-0.255	-0.623
Affordable Loss x Importance to Identity	0.504	0.672**
Flexibility x Membership Esteem	-0.048	-0.185
Flexibility x Private Collective Self Esteem	-0.003	-0.177
Flexibility x Public Collective Self Esteem	-0.164	0.129
Flexibility x Importance to Identity	0.829	1.102*
Precommitments x Membership Esteem	-0.081	0.059
Precommitments x Private Collective Self Esteem	-0.176	-0.377
Precommitments x Public Collective Self Esteem	-0.823	-0.988**
Precommitments x Importance to Identity	0.863*	0.992**

Table 15. Findings of Regression Analysis - Continued

Dependent Variable: Environmental Hostility – (Analysing Industry)		
Controls		
Industry -	0.005	
Electronics		-3.059*
Financial Sector		-4.235***
IT / Software / Internet		-2.331**
Media		-2.160
Construction/ Real estate		-3.763**
Sales/ eCommerce		-2.721**
Professional Services like Consulting		-2.479*
Logistics		-2.777*
Others		-2.684**
Constant	3.343***	6.071***
R^2	0.526	0.800
$R^2 adjusted$	0.032	0.386
F	1.06	1.93*

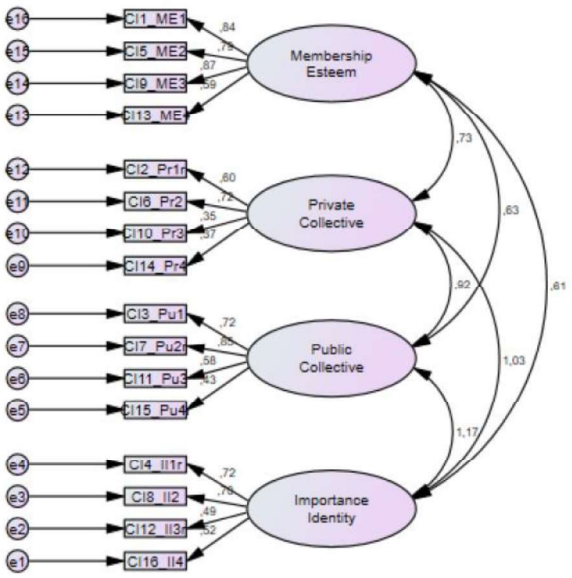

Figure 1: First order analysis CFA of CI - (Correlations >1)

The following covariance matrix is not positive definite (Group number 1 - Default model)

	Membership_Esteem	Private_Collective	Public_Collective	Importance_Identity
Membership_Esteem	,974			
Private_Collective	,388	,290		
Public_Collective	,388	,311	,392	
Importance_Identity	,406	,371	,490	,449

Figure 2: Error reported for a not positive definite matrix in CI CFA.

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Eidesstattliche Erklärung

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